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Vol. 6 • No. 1

## OBJECTIVES OF THE AMERICAN ACADEMY OF DENTAL MEDICINE

(*Quoted from the Constitution*)

"To promote the study and dissemination of knowledge of the cause, prevention and control of diseases of the teeth, their supporting structures and adnexa and related subjects; and to foster and promote a better scientific understanding between the fields of dentistry and medicine."

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# *Editorial*

## THE RHODE ISLAND PLAN FOR FURTHERING MEDICAL-DENTAL RELATIONSHIPS

A foresighted advance in medical-dental relations took place in Rhode Island with the appointment of committees of both professions under the sponsorship of their respective professional societies.[2] The members of the original committee were: Charles L. Farrell, M.D., chairman; Albert L. Midgley, D.M.D., ScD., secretary; Harold Calder, M.D., Frank Canning, D.M.D.; Charles Cannon, D.M.D.; James F. Colgan, D.M.D.; Nicholas Migliaccio, D.M.D., and Edward T. Streker, M.D. Dr. Midgley is now the chairman of the sub-committee on medical-dental relations of the Rhode Island State Dental Society.

A motivating impetus for the action was a suggestion of the Commonwealth Fund's Commission on Hospital Care[1] in 1947 which stated, "Dental examinations, directed toward the discovery and diagnosis of dental and oral infections which may be related to systemic diseases, should be made of all patients admitted to hospitals except when the physician in charge pronounces this procedure unnecessary or impractical."

The objective of the study by the Joint Committee from the Rhode Island Medical Society and Rhode Island State Dental Society, after consideration of the policies, education, research, teaching institutions, and other elements of each profession, was primarily an effort to determine the bases for closer relationship between the professions. The obvious means for reaching this goal include a positive attitude toward cooperation; a method for broadening the knowledge of both professions in their interrelated problems; and a system of coordination of dental services with medical and dental services.

Henry Scheer and George F. Clarke[3] reported for the Committee on Dento-Medical Relations of the American Academy of Dental Medicine on the Rhode Island Plan with merited commendation, listing some of its practical applications. These were given as "1) Question and answer programs at state dental society meetings in which physicians and dentists participate. 2) An annual course of lectures on subjects of common interest to dentists and physicians. The lectures are given under university auspices and are endorsed by the Medical Society. (The subject of the first course held in March and April of 1950 included lectures on antibiotic therapy, neurophysiology, pediatric psychology and diagnosis.) 3) A medical-dental study club to promote the study of biological phases of dental problems. 4) Work on reorganizing the dental departments of hospitals in the state, so that they be properly integrated with the other hospital services."

The American Academy of Dental Medicine heartily welcomes the Rhode Island Plan for furthering medical-dental relationships and views with interest the result of its efforts. The Academy has, from the time of its founding in November 1945, dedicated itself to the advancement of the study of dental medicine and the promotion of public health. It has aimed at this goal by the united action of both dentists and physicians—both professions being represented in the membership.

The Academy has taken some definite steps in promoting the study and dissemination of knowledge of the cause, prevention and control of diseases of the teeth, their supporting structures and adnexa and related subjects; and fostering and promoting a better scientific understanding between the fields of dentistry and medicine.

Through the pages of the quarterly Journal of Dental Medicine, the Academy publishes original articles on clinical and scientific research pertaining to dentistry

and medicine and particularly suited to meet the integrated aims of dental-medicine. In addition, surveys of the medical and dental literature and reviews of books pertaining to the interests of the Academy appear in the Journal.

The regular Midwinter and Annual meetings of the Academy have been so well received in dental and medical circles and the clinics and lectures have been so productive of improvement in knowledge on dental-medicine and in interprofessional relations that they are certain to be a permanent feature of Academy activities. It is because of its total experience in advancing the aims of dental medicine that the Academy welcomes the Rhode Island Plan for furthering Medical-Dental relationship, congratulates its sponsors, wishes the best for the plan and those who contribute to its function, and awaits with interest reports of its accomplishments.

J. L. B.


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## S. Leonard Rosenthal and J. Lewis Blass Join J.D.M. Staff

It is with pleasure that the Publication Committee announces the association of two eminent educators to the staff of the Journal of Dental Medicine—S. Leonard Rosenthal and J. Lewis Blass. Both men will serve in the capacity of Associate Editors.

Dr. Rosenthal is Assistant Professor of Periodontia, Temple University Dental School and Assistant Professor of Oral Medicine at the Graduate School of Medicine, University of Pennsylvania. His other activities given here in part are:

Visiting Periodontist, Mt. Sinai Hospital of Philadelphia; Diplomate, American Board of Periodontology; Fellow of the American College of Dentists; Diplomate, San Carlos University, Guatemala; Honorary member of the Academy of Stomatology and of the Arequipa Dental Association of Peru; Member of American Academy of Periodontology; American Academy of Dental Medicine; Philadelphia Society of Periodontology (past president); Eastern Dental Society; Academy of Stomatology of Philadelphia; International Association for Dental Research (Editor-Phila. Section); Pan American Odontological Society; American Dental Association and local branches; Author and lecturer.

Dr. Blass, who is well known to all members of the Academy as past president, is Associate Professor of Periodontia at New York University College of Dentistry.

He is also Consultant in Periodontia, Samaritan Hospital, Brooklyn; Postgraduate Lecturer in Therapeutics, Periodontia and Practice Management at New York University; Diplomate, American Board of Periodontology; Fellow of the American College of Dentists; Member, American Academy of Dental Medicine; American Academy of Periodontology; American Dental Association and local branches; Omicron Kappa Upsilon; Delta Sigma Theta; Alpha Omega; Author, "Keep Your Own Teeth" (with H. Roth); "Successful Dental Practice" (with I. Tulkin); Contributor, to "Text Book of Oral Diagnosis and Treatment Planning" (S. C. Miller)-Co-Author "Text Book of Periodontia." (S. C. Miller).

*The reason a hole in the tooth feels so large to the tongue is because of the natural tendency of the tongue to exaggerate.*

# ENZYMOLOGY AND BIOCHEMISTRY OF THE MOUTH*

IRWIN W. SIZER, A.B., Ph.D. *Boston, Mass.*†

Enzymes are the catalysts of life which motivate practically 100% of all the chemical reactions which take place in living organisms. It has been stated with considerable accuracy that "Life is just one darned enzyme reaction after another." In fact, there is no single chemical which comes closer to representing the properties of life than does an enzyme. Because of the paramount role played by enzymes in the metabolism of all living things, a most intensive study of enzymes has been made during the past 100 years. These researches have been most successful and have yielded invaluable information concerning the nature and general properties of enzymes and their relationship to living matter.

## CHEMICAL NATURE OF ENZYMES

Enzymes may be defined as highly specific organic catalysts of colloidal size produced by living cells. Like typical catalysts they accelerate chemical reactions in either direction, but in no case do they alter the equilibrium point of the reaction. Very intensive efforts for over a century to purify enzymes finally resulted in the production of the enzyme urease in pure crystalline form by James Sumner in 1926. Since that time more than 50 enzymes have been purified to the crystalline condition. Micro-chemical analyses of these pure enzymes in all cases revealed that the enzymes were proteins. Enzymes may be redefined, therefore, as *protein catalysts*. Many enzymes are not simple proteins, but have a non-protein group loosely or firmly bound to the protein (apoenzyne; see Fig. 1). If such a non-protein group is loosely bound, it is called a coenzyme and can easily be removed from the enzyme by dialysis across a cellophane membrane. The enzyme is, of course, inactivated by this procedure, but the activity can be readily restored by recombining the coenzyme with the protein.

Protein (inert) + coenzyme (inert) ⟷ enzyme (active)

Most of the coezymes have themselves been purified and shown to be almost invariably vitamin derivatives. Vitamins of the B group are especially important in this respect and are vitally concerned with the metabolic or respiratory enzymes of the cell which bring about the oxidation of foodstuffs to carbon dioxide, water and nitrogen bases such as ammonia, urea and uric acid. It is apparent from this research that many vitamins are essential in the diet, because they constitute indispensable components of many of the respiratory enzymes of the cell.

Some enzymes contain a non-protein grouping (called the active group of the enzyme) which is so tightly bound to the protein that it cannot be dialyzed away, but can be dislodged by more drastic chemical procedures. Examples of enzymes of this type are catalase, peroxidase and cytochrome, which are closely related to hemoglobin and contain heme firmly bound to a protein. Many enzymes possess a metal atom as the active grouping. This metal (e.g. copper in tyrosinase) may be firmly bound to the protein. As in the case of the vitamins, it is believed that many metals are required in the human diet in small amounts, because they comprise the indispensable, active groupings of many vital enzymes.

## GENERAL PROPERTIES OF ENZYMES

Whenever a new enzyme is discovered, the problem of its isolation and characterization is greatly facilitated by proceeding on the assumption that the new enzyme is a protein. Had we known

* Address given at the Annual Meeting of the American Academy of Dental Medicine in Boston on June 24, 1950.

† Associate Professor of Physiology, Department of Biology, Massachusetts Institute of Technology.

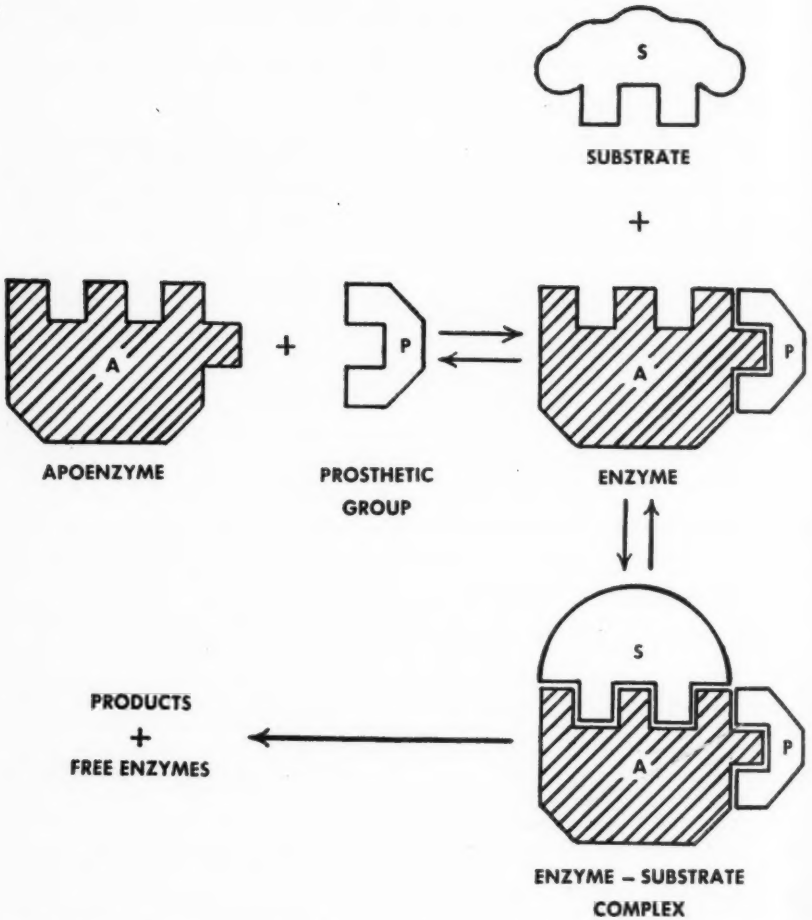


*Fig. 1: Schematic diagram to show how a protein (apoenzyme) can combine with its coezyme to form an enzyme, which then unites with substrate to finally release enzyme plus reaction products. (After McElroy[7]).*

ahead of time that enzymes were proteins, much of the hundred years or more of research on the elucidation of the properties of enzymes could have been spared or at least shortened. As typical proteins we expect enzymes to be huge colloidal organic molecules of molecular weights in the hundred thousand range. We also might predict that enzymes, like typical proteins, would be extremely sensitive to such variables as pH, temperature, oxidation, toxic heavy metal ions, denaturing agents of all kinds, ionic strength of the medium, drugs, hormones, antibodies, and antibiotic agents, as well as subject to attack (especially hydrolysis and oxidation) by other enzymes. As our knowledge of proteins increases, we can expect that the information gained will be directly applicable to enzymology. It should also be

pointed out that work with enzymes has contributed greatly to our understanding of the protein molecule.

Some of the most important factors which influence enzyme activity will be discussed briefly.

### ENZYME CONCENTRATION

Many enzyme reactions increase in rate in direct proportion to the amount of enzyme present. With many crude enzyme preparations, however, doubling the amount of enzyme produces less than a 100% increase in rate, because of the presence in the system of certain enzyme inhibitors which interfere with the reaction.

### SUBSTRATE CONCENTRATION

As the amount of substrate for the enzyme is raised, the rate of the reaction first increases very rapidly, then more slowly, and finally, at high substrate concentrations, becomes independent of the amount of substrate present. A plausible explanation for this relationship is that an enzyme chemically combines with its substrate (see Fig. 1) to form an enzyme-substrate complex. At high substrate concentrations all of the enzyme is already in combination with its substrate, so that the rate becomes independent of further increase in amount of substrate.

### pH

Most enzymes are extremely sensitive to the hydrogen ion concentration of the medium and exert maximum activity at a single pH. On either side of the optimum the activity falls off in a dramatic fashion. Explanations of the pH effects on enzymes are complex, but in general it can be said that the hydrogen ion concentration affects the dissociation of acidic and basic groups of the enzyme protein molecule and in addition may have an important effect on the ionization of the substrate molecule.

### TEMPERATURE

As the temperature of the system is elevated, the rate of enzyme-catalyzed reactions rises sharply until a maximum is reached at 50-60° C. At temperatures above the optimum, the rate falls off rapidly to zero. At temperatures below the optimum, it is believed that rate rises with temperature because, as with non-enzymatic reactions, heat produces an increase in the number of "activated" collisions between reacting molecules. At temperatures above the optimum the retardation in rate is due to the heat denaturation and inactivation of the protein enzyme molecules.

### OXIDIZING AND REDUCING AGENTS

Enzymes vary greatly with reference to their sensitivity to mild oxidants, but about one-half of the known enzymes are inactivated reversibly by them. They can be reactivated by the addition of mild reductants. It is believed that it is the sulfhydryl (SH) groups of the enzyme molecule which are critical in this respect, their oxidation to disulfide (SS) groups results in inactivation of the enzyme:

$$\underset{\text{(active enzyme)}}{\text{En SH}} \underset{\text{reduction}}{\overset{\text{oxidation}}{\rightleftharpoons}} \underset{\text{(inactive enzyme)}}{\text{En SS En}}$$

All enzymes, whether or not they contain sensitive sulfhydryl groups, are inactivated by violent oxidizing agents such as iodine and potassium permanganate which oxidize, usually irreversibly, other active centers such as tyrosyl groups in the enzyme molecule.

### ENZYME ACTIVATION

Many enzymes are secreted in an inactive form and must be activated by certain chemicals or by other enzymes. An example of this is the enzyme thrombin which clots blood by converting fibrinogen to fibrin.

$$\underset{\text{(inert)}}{\text{prothrombin}} \xrightarrow{\text{thrombokinase}} \underset{\text{(active)}}{\text{thrombin}}$$

In other cases specific ions are required for enzyme activity. Ptyalin, the starch digesting enzyme of saliva, is activated by chloride ions. Very small amounts of metal salts are important in the activation of many enzymes.

## ENZYME INHIBITION

A wide variety of different chemicals inhibit enzymes which are, as a rule, exquisitely sensitive to trace amounts of certain inhibitors which may be present in the environment. In this category of enzyme inhibitors are classified such biologically active agents as mustard gas, drugs, antivitamins, chemical reagents for proteins, bacterial toxins, antibodies, protein inhibitors, certain hormones and even enzymes themselves. Enzyme inhibitors may act in a number of different ways. They may chemically change the protein part of the enzyme, e.g. by hydrolysis or oxidation. They may compete with substrate for the active group of the enzyme (see Fig. 1) thereby preventing the enzyme from combining with its substrate, or they may prevent the coenzyme from combining with the protein (the apoenzyme) to form the active enzyme. Still other inhibitors may exert their action on the enzyme-substrate complex. Thus, we see that there are numerous different mechanisms whereby competitive or non-competitive inhibitors can interfere with enzyme action. In view of the key role which enzymes play in living phenomena, it is not surprising that today a tremendous amount of study is being devoted to an investigation of inhibitors which may control these enzyme reactions.

## ENZYMES OF THE MOUTH

Students of dental medicine are understandably interested in enzymes of the mouth especially those of the blood, gingiva, teeth, saliva and of bacteria in the saliva. The enzymes of the gingiva and teeth are like those of any other tissue and concerned with all the problems of anabolism and catabolism which are constantly proceeding in living matter. In addition, in the teeth, enzymes concerned with the synthesis of bone, such as the phosphatases, are of particular importance. The hardness of the enamel and dentin laid down, as well as the amount and nature of the muco-proteins deposited in the teeth may be of critical importance in setting up a barrier against the actions of bacteria or eroding acids or both in the production of dental caries. The enzymes of the blood clotting system are of paramount interest in problems of oral surgery and tooth extraction where serious bleeding may be encountered. In such conditions the addition of such components of the clotting machinery as thrombin, fibrinogen, or fibrin may help to solve the problem.

Ptyalin, the enzyme which converts starch or glycogen to maltose, is the only important digestive enzyme in saliva. This enzyme operates ideally in the mouth at 37° C at pH 7.0 and in the presence of a small amount of sodium chloride as activator. Thus, this enzyme rarely concerns the student of dental medicine, except indirectly since the sugar produced by ptyalin may in turn act to promote bacterial growth and produce organic acids harmful to the teeth.

Dental caries constitutes one of the most critical problems in dental medicine. Many people believe that caries are produced by the action of acids on the teeth. On the one hand interest lies in understanding the metabolism of the teeth and the mechanisms whereby enzymes of the teeth can destroy or neutralize the acids or elaborate materials such as inorganic salts and muco-proteins which are resistant to acid action.

On the other hand, the problem can be attacked by focusing attention on the acids themselves. These are acids, such as phosphoric (from carbonated beverages) and citric (citrus fruits), contained in the food and beverages which we eat and drink. Dentists have tried to handle this aspect of the problem by urging frequent brushing of the teeth with dentrifices containing bases (e.g. milk of magnesia or ammonia) to remove or neutralize these acids. Of far greater importance than acids in food and beverages in causing caries, however, are the organic acids secreted by the bacteria which thrive in the mouth. These acids are most likely to be organic acids, like lactic and pyruvic, which have a powerful eroding action on the enamel of the teeth. Such acids arise primarily from the fermentation of carbohydrates by enzymes of the

oral bacteria. The popular belief that eating sugar causes dental caries may have some basis in normal practice, but if the residual sugar is completely removed from the mouth after its ingestion, then there is no reason for blaming sugar for dental caries. Since oral bacteria can be justly accused for the production of organic acids leading to caries, much attention has been and will be devoted to controlling these organisms and their enzyme systems. The now widely used sodium fluoride treatment for the prevention of caries may be useful, because fluoride is a powerful inhibitor of certain enzymes, especially those of phosphorylation. The ammonia-and urea-containing dentrifices may have some beneficial action, because the ammonia or the urea or both inactivate certain enzymes of fermentation, which are involved in the production of organic acids. Some of the new antibiotic agents such as the sulfa drugs, atabrin, and others have already been shown to inhibit important enzyme systems. As new antibiotics are developed and tested, we can expect that some of these will find a role in oral hygiene as inhibitors of bacterial enzymes responsible for the production of dental caries caused by organic acids. We can also predict, as research in both fields progresses, that enzymology will become of increasing importance to workers in the field of dental medicine.

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## A.A.D.M. Mid-Winter Meeting

The annual mid-winter meeting of the American Academy of Dental Medicine was held December 3rd at the Hotel Statler in the City of New York.

President Louis R. Burman opened the morning business session which was then followed by a hearty informal luncheon.

Consideration of the "Problems Occurring During Growth and Senescence of the Oral Mechanism" was the theme of the afternoon scientific session. Dental and medical views were expressed by five eminent men in each of their own special studies: Nutrition (Dr. Robert Goodhart), Endrocrinology (Dr. Abner I. Weisman), Physiology (Dr. Philip Person), Orthodontics (Dr. J. A. Salzmann) and Rehabilitation (Dr. Louis A. Cohn).

The large attendance at this meeting attests to the continuous growth and development of the interest in dental medicine. As Johnson once said, "The seeds of knowledge are planted in solitude but must be cultivated in public." The American Academy of Dental Medicine's soil is developing greater ferility and so more suitable for additional cultivation.

G. W.

*A man's idea of an intelligent friend*
*is one who always agrees with him.*

# INTRA-ORAL CANCER†

THOMAS J. ANGLEM, M.D., F.A.C.S., *Brookline, Mass.**

The concept of the prevention of oral cancer is a most intriguing one and one worthy of serious consideration, because the really great strides in the reduction of mortality from disease have been in the field of preventive medicine.

The surgeon, by prodigious effort, by the perfecting of surgical techniques, and by advances in pre and postoperative care, is often rewarded by seeing a small percentage of increase in the number of cases salvaged, but the widespread application of well-conceived preventive measures often results in an enormous fall in mortality and, not infrequently, in the virtual elimination of a disease.

The intelligent application of preventive measures presupposes a knowledge of the cause of the disease. In oral cancer, as in all other cancer, the ultimate cause is unknown, but there are known and well-recognized proximate causes or etiologic factors which are widely accepted, perhaps to a greater extent than in any other field of cancer.

In any discussion of the etiologic factors leading to the development of oral cancer, the following are mentioned: syphilis, the use of tobacco, bad dental hygiene and avitaminosis, and given different order of importance by different writers.

There is general agreement that syphilis plays an insignificant role in oral cancer except in the case of cancer of the tongue, in which from 20 to 30 per cent arise on the basis of a pre-existing luetic glossitis, a well-defined and relatively easily recognized clinical entity.

Unfortunately, from the standpoint of statistical analysis, usually two or more of the remaining factors are present in the majority of cases of oral cancer.

It is, however, almost axiomatic that cancer does not occur to any significant degree in a clean healthy mouth which has had the benefit of good oral hygiene and proper dental care. It follows bad dental hygiene, dental caries, and gingival sepsis like a shadow. It is to a very large extent a class disease—a clinic disease, and it occurs predominantly in persons in that segment of the population who from earliest childhood, through ignorance, lack of education or simple lack of economic ability, have not had the benefit of good oral hygiene and dental care. This disease, therefore, constitutes a great challenge to the dental profession.

Some writers, including Martin,[3] who has had an extensive experience with oral cancer, are inclined to minimize the importance of dental defects as an etiologic factor, because it is undoubtedly true that the number of cases in which a specific point of irritation is in exact apposition to the developing cancer are small; according to Archer and Morris[1] 12 per cent. There are cases where one sees a crater-like cancer in the cheek or tongue into which a jagged rough carious tooth fits like a hand in a glove, and others where a cluster of such carious snags, usually in the lower jaw are embedded in and surrounded by a proliferating cancer arising from a swollen spongy hyperemic gum with profuse pyorrheal discharge.

More often, the precise point of irritation is not so obvious, yet it is a fact that except for cancer arising on the basis of a luetic glossitis, which occurs on the dorsum of the tongue, the vast majority of oral cancers occur at the occlusal level of the teeth, either on the lateral border of the tongue, or at the occlusal level on the cheek or in direct relation to the teeth in the gums and in the floor of the mouth.

In a study of 40 cases of oral cancer from this point of view, the writer found an incidence of a dental factor in twenty-eight or 70 per cent.

The specific factors which are frequently seen in relation to the development of oral cancer are:

1. Dental caries with sharp irregular

* Associate Professor of Surgery, Boston University.

† Presented at the Annual Meeting of the American Academy of Dental Medicine in Boston, June 25, 1950.

snags impinging on the mucous membrane with or without associated gingival sepsis.

2. Malposition of teeth with chronic irritation from impingement on the tongue or buccal mucosa as the bite is closed.
3. Partial loss of teeth permitting the cheek to fall into the defect or the tongue to belly out, permitting adjacent teeth, often sharp and carious, to impinge on the tongue or cheek.
4. Malfitting dentures of varous types, —plates or bridges which slip or rub, crowns partly displaced and presenting sharp edges against the tongue or cheek.
5. Alveolar atrophy which results in a poor fit of a once well-fitting plate. It is not uncommon to find patients wearing dentures 20 to 25 years old, cracked and eroded and with roughened margins.

These are all important, but it would be an oversimplification of the problem to suggest that the universal provision of dental care from childhood on is the final solution.

The significance of avitaminosis as a predisposing factor to the development of oral cancer is receiving increasing attention. Martin and Koop[4] who have been interested in this aspect of the problem, point out that in most cases of oral cancer, in addition to the specfic lesion, there are definite underlying degenerative changes of the oral mucous membranes which obviously have antedated the malignant growth. It was formerly believed that these changes, usually considered as precancerous, were due to some local irritant, but as knowledge of objective changes in oral mucosa, resulting from vitamin deficiencies has increased, it has become clear that many of these degenerative changes arise on this basis. The most significant of these changes are subacute or chronic inflammation, vascular injection, atrophy or hypertrophy of the papillae, erosion of the epithelium, perleche, fissuring at the oral commissures, etc. Martin and Koop[4] believe that the significant deficiency in the development of these degenerative changes is the Vitamin B-Complex.

The vulnerability of the entire upper gastrointestinal mucous membrane to cancer in the susceptible individual is attested by the frequency of multiple lesions. In a series reported by Slaughter,[7] 18 per cent of the patients had more than one cancer. These may be as far apart as tongue and esophagus.

The most fascinating studies with which the writer is familiar and which shed much light on this problem are contained in reports by Orr and Somervell.

Somervell,[8] reporting on his experience in the treatment of oral cancer in Travancore, India, in a 200 bed hospital reports on the astonishing figure of 10,480 operations for malignant disease of the oral cavity. In the United States oral cancer constitutes sabout 6 per cent of all cancers. Somervell states that in Travancore, not only is oral cancer the most common type of cancer, but it exceeds the incidence of all other cancers combined.

Orr[6] in an earlier paper from the same hospital made a survey of 669 cases with regard to their dietary habits and the custom of betel nut chewing. He found some interesting variations in the incidence of cancer, depending on variations in the make-up of the quid chewed by various groups and felt that certain types of tobacco included in the quid were the responsible irritants, rather than the betel nut itself. However, the most interesting observation which he makes is the statement that the diet of the Travancore people is, perhaps of all human diets, the one in which the vitamin elements are most poorly represented. A typical diet for one day is as follows: tapioca 3-4 lbs., rice 1 lb., rice water 3 pts., tamarind grs. 30-60, red chillies grs. 60 to 80, fish occasionally.

A most striking observation is the fact that among the hill coolies on the tea estates, just a short distance from the coastal area, though they chew the same type of betal nut, oral cancer is almost unknown. The hill coolies receive higher pay and have a larger variety of vegetables in their diet.

Another clear example of the significance of nutritional deficiency in the development of oral and upper gastro-intestinal cancer is the well-known high incidence of such lesions in the so-called Plummer-Vinson syndrome, a deficiency state common in Sweden, particularly among women, characterized by dysphagia, hypochromic anemia, achylia and the objective findings in the oral cavity usually associated with Vitamin B deficiencies, such as perleche, atrophy of lingual papillae and cheilitis.

Lastly, the possible role of disturbance of hormonal secretion as a factor in the development of luekoplakia, one of the recognized pre-cancerous lesions, should be mentioned. Lund and Sturgis[2] have reported that 12 per cent of patients with leukoplakia develop oral cancer, and Lund, Nathanson[5] and Weisberger[9] have shown that regression of leukoplakia occurs in certain cases upon the administration of estrogen.

If this array of observations can be regarded as significant, and I believe they can, then, it seems almost certain that there are two major factors responsible for the development of oral cancer; first, an underlying nutritional deficiency which prepares the soil, and, secondly, a proximate factor, which may be any form of chronic irritation, which is the seed.

There are, then, three levels at which significant preventive measures may be directed against oral cancer.

The first lies within the province of the nutritionist and is perhaps more a social than a medical problem and consists of the wide application of present knowledge and future discoveries, in the field of nutrition especially, as to the content of a fully adequate diet and in making such a diet available to the whole population. It may well be that the agronomist, the expert on the productivity of the soil, may play a key role in this effort. These experts have already demonstrated the relationship between the lack of resistance to disease, not only of grains and grasses and other vegetable products produced on overworked and leached out soils, but also of the live stock dependent on the produce of such soils.

The exploration of the importance of trace elements and naturally occurring hormones and antibiotics in the soil is just beginning. It has already been shown that the trace element cobalt is essntial for the synthesis of Vitamin $B_{12}$, and it is not at all impossible that a lack of other factors yet unknown may predispose to the development of oral and other malignant tumors.

The second level of attack lies in the early recognition of precancerous states due to deficiencies and other causes and the institution of corrective measures before irreversible changes have taken place. The practicing dentist has an unparalleled opportunity to discover these changes, identify them and to induce the patient to seek proper treatment.

The third level of attack lies in the elimination of the proximate or immediate causes, the specific irritations which undoubtedly play a part in the origin of many oral cancers. Of these, the dental factors are most susceptible to correction. The economic problem of providing the whole population with good oral hygiene and systematic and continuing dental care is without doubt a difficult one, but a significant fall in the incidence of oral cancer will undoubtedly be a by-product of every advance in this direction.

The treatment of established oral cancer is a subject which does not lend itself to easy generalization. It is, first of all, not a single disease, but includes cancer of the lip, floor of the mouth, buccal mucosa, alveolar mucous membranes, tongue, and hard and soft palate, each with its own peculiar features which influence its course and the choice of treatment.

The agencies available for the treatment of oral cancer are surgery, including as well as sharp dissection the use of the actual cautery and surgical diathermy; and radiation, including the use of the roentgen ray and radium.

The choice of surgery over irradiation or vice versa is dependent on a large number of variable factors and is influenced to a considerable extent by the ex-

perience of the attending doctor. In general, the advantage of irradiation over surgery lies in the superiority of the early functional and cosmetic result. On the other hand, the frequency with which late complications due to irradiation occur, such as fibrosis, telangiectatic change in the skin, soft tissue and bone necrosis, detracts seriously from the apparent advantage offered by this method of treatment.

In the opinion of this writer, in most instances of primary disease in the oral cavity in which the disease is technically within the limits of operability, surgical extirpation offers the best chance for cure. Irradiation, especially with the interstitial use of low content radium needles is, nevertheless, an effective method of treatment and under some circumstances may be preferable to surgery, and it is, of course, of great value in the management of surgically inoperable lesions.

The management of the primary lesion within the oral cavity comprises only part of the treatment of the disease. The frequency with which cancer of the oral cavity invades the lymph nodes of the neck is such that management of obvious or possible disease in the neck nodes must be considered in every case.

The proper handling of the cervical lymph nodes is dependent on a large number of variable factors. For example, there may be no lymph nodes palpable in the neck; there may be palpable nodes which the observer may consider to be hyperplastic and not carcinomatous. Such clinical evaluation is never reliable. The reverse may be true and there may be nodes in the neck which the observer considers metastatic but surgically operable. This opinion may be erroneous, such nodes may be only hyperplastic. There may be inoperable nodes in the neck. The lymph node involvement may be unilateral,—on the same side as the primary lesion, or it may be contralateral or bilateral. The problem is further complicated by the fact that the primary lesion may be unilateral or may cross the midline and involve both sides of the oral cavity, and still further by marked variations in the degree of malignancy of the primary lesion. Obviously, any detailed discussion of the management of the lymph nodes of the neck in oral cancer is beyond the scope of this paper, but certain basic principles in the treatment of cervical nodes may be enumerated. First, the treatment of choice is surgical extirpation. Irradiation is of value in the palliative treatment of inoperable disease, but cannot be relied on for cure. Secondly, surgical attack on the lymph nodes of the neck is indicated only when the primary lesion is cured or probably curable. When the primary lesion approaches or crosses the midline, bilateral dissection of the neck should be done.

One of the most difficult and controversial problems in this whole field is the decision as to the course to be pursued when there is no clinical evidence of disease in the cervical lymph nodes. Should the nodes be dissected on the chance that microscopic disease may be present or should the patient be followed until there is clinical evidence of disease? There is no simple answer to this question, but it may be stated that when the primary lesion is of relatively low-grade malignancy, as in most cases of carcinoma of the lip and some cases of carcinoma of the buccal mucosa and the primary lesion is small, a conservative policy may be adopted and the patient followed at frequent intervals. Where the primary lesion is of relatively high malignancy, as in most cases of carcinoma of the tongue, floor of the mouth and alveolar mucous membranes, the likelihood that microscopic disease is present in the lymph nodes is sufficiently great to warrant a policy of prophylactic neck dissection in most cases.

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## Fluoridation of Water Systems*

The fluoridation of public water supplies as a partial protection against tooth decay was described editorially in a recent issue of The Journal of the American Dental Association as "a tremendous step forward in the profession's fight against dental disease."

Fluoridation is the process of adding small amounts of fluorine salts in the proportion of 1 to 1.5 parts per million to the central water systems of cities and towns.

The editorial, however, sounded a note of caution against viewing fluoridation as a panacea. "The artificial fluoridation of drinking water . . . is not a cure-all," it said. "It will not protect children completely from dental decay."

The addition of fluorides to domestic water supplies has now been recommended as a decay-control measure by the U. S. Public Health Service and the American Water Works Association for communities "subject to the approval of the state and local health authorities and the dental and medical professions."

Large scale control tests have been carried on within the past five years in a number of cities. Preliminary reports reveal that children drinking water containing small amounts of artificially-added fluorine salts had substantially less tooth decay than did those drinking fluoride-free waters.

Among cities with control tests are Grand Rapids, Mich., Newburgh, N. Y., Brantford, Ontario and Sheboygan, Wis. Tests have also been started at Evanston, Ill., Ottawa, Kans., Midland, Mich., and a number of Wisconsin communities.

"In fact," the Journal stated, "the reports warrant the assumption that the fluoridation of drinking water may, at the end of ten years, reduce significantly the incidence of caries (decay).

"Certainly the opinions of such authoritative bodies as the American Water Works Association, the State and Territorial Dental Health Directors and the U. S. Public Health Service should dispel any lingering doubt about the advisability of fluoridating communal drinking water, and they should open the way for all communities having a central water system to provide a simple, inexpensive measure which will partially protect their children from the ravages of caries."

In a separate article, Dr. Francis A. Bull, of Madison, state director of dental health for Wisconsin, reported that 80 per cent of the state's urban population had adopted the technic. He said that 27 Wisconsin cities, including Madison, were fluoridating their water supplies and 37 more, including Milwaukee, were installing equipment for the program.

Dr. Bull also warned, however, that fluoridation should not be considered a cure-all. He said that at best it would leave urban residents with at least one-third of their present dental decay rate and pointed out that the fluoridation procedure would be of no help to rural residents.

The Wisconsin official said findings at Sheboygan, where public water supplies have been fluoridated since 1946, revealed reductions in tooth decay among children ranging from 18 to 39.6 per cent.

Dr. Bull said the fluoridation process was a simple engineering problem and the cost averaged about 10 cents per person per year in Wisconsin cities.

* A.D.A. Press Release.

*The problem is to keep the "pause that refreshes" from becoming a full stop.*

# LACTOBACILLUS ACIDOPHILUS COUNTS IN PERIODONTAL DISEASE

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Whether dental caries and periodontal disease are antagonistic mechanisms has been a matter of great interest and considerable dispute among dentists. The problem is more than an academic question; for should these processes prove to be antithetic, such proof might lead to effective control measures for one or both of these diseases.

For many years, knowledge of the incidence of dental caries in patients with periodontal disease was limited to the general impressions of practitioners. Some expressed the opinion that periodontal disease was accompanied by a low caries index.[2, 3] The first attempt to determine scientifically the incidence of caries in the periodontal patient was made by Miller and Seidler[6] who compared the number of decayed, missing and filled teeth (DMF) of 1003 patients with periodontal disease to that of a control group of similar ages with a normal periodontium. They concluded that there was no significant difference between the two groups.

Unfortunately, the problem cannot be solved this way. Missing teeth may result from caries, periodontal disease, trauma, or congenital absence. Restorations may have been inserted before the inception of periodontal disturbance; and may have been constructed to control decay, to restore normal contact, to support fixed bridges, or to restore fractured teeth. In short, the DMF rating represents structural loss during the life of the individual. It does not indicate caries incidence at a specific time.

Caries activity of the moment can be measured by a count of the Lactobacillus acidophilus in the saliva.[1, 4, 7] A count of 10,000 or more per cc has been accepted to be significant of caries activity. There is no analogous measurement of periodontal disease. It is logical to postulate that disease of the periodontium has its stages of activity and remission for which there is no accurate measure as yet. However, histologic or clinical signs of inflammation or degeneration permit a logical assumption of active disease processes.

Therefore, the Research Committee of the American Academy of Dental Medicine decided to compare L.acidophilus counts of persons with and without periodontal disease. The project was undertaken at the Temple University School of Dentistry. One hundred patients were selected for the initial studies: 50 with periodontal disease and 50 free from this disorder. They were divided into 5 age groups: 15-20, 21-30, 31-40, 41-50 and over 50. There were 23 males and 27 females in the control group; 22 males and 28 females in the periodontal disease group. In the latter group, 13 were diagnosed as gingivitis, 36 as periodontitis and 1 as periodontosis. Stimulated saliva was obtained before treatment. The lactobacillus count was made by the Department of Bacteriology under the direction of Doctor Herbert Cobe.

## RESULTS

A comparison of the results showed great variation in the count of individuals of every age both in the control and periodontal disease groups. The highest counts in both groups were at the age levels of over 50 and 31-40. Partial dentures are more likely to be found in the higher age groups. Since lactobacilli are found in greater numbers around these appliances, it may account at least in part for the higher counts at these ages. No significant difference could be found between the counts of those with gingivitis, periodontitis and periodontosis or between males and females.

The group with periodontal disease

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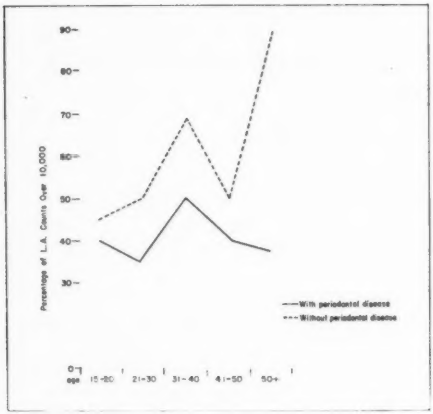


Fig. 1

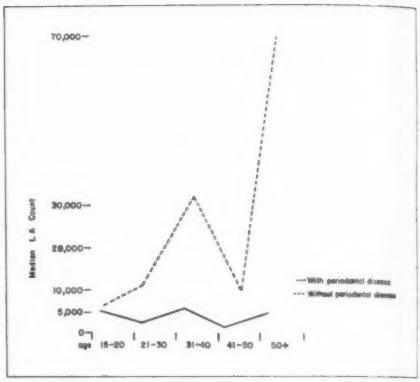


Fig. 2

had consistently lower counts than did the controls. There were no lactobacilli recovered from 19 of those with periodontal disorders while only 1 of the controls failed to show this organism. The percentage of counts over 10,000 was lower at every age level for those with disease of the periodontium (Fig. 1). The median count at each age level also was lower in periodontal disturbances (Fig. 2).

These findings are not unreasonable. Jacobson and Kesel[5] found few L.acidophilus in 22 periodontal diseased persons, which fact they attributed to the high ammonia nitrogen content of the saliva. While the number of patients in this study is too small to permit any conclusions to be drawn, it seems worthwhile to continue the experiment.

Medical Arts Building

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*People who put on the most style usually put off the most creditors.*

# STOMATOPYROSIS AND GLOSSOPYROSIS SYNDROME†

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For almost a century, because of overspecialization and overmechanization, medicine has been treating the human body as if it were headless. At present, there is a growing tendency in the opposite direction. Because of their basic misconception of psychosomatic medicine many physicians and dentists are treating the head as if it were unrelated to the body.

We have now arrived at a stage, where we fully recognize that the soma and psyche are interrelated, interactive and interdependent. Disease, as we understand it today, can be considered as a pathologic process within the living being. However, to the person afflicted with disease it is more than merely a pathologic process, because it often is a highly painful personal emotional experience.

Let us take as an example an individual who has just had a routine physical examination required by an insurance company. Unaware of any symptoms prior to the examination, he is suddenly shocked by the report that the electrocardiogram indicates some slight abnormality of the heart muscle. The emotional effect may be sufficient to demoralize the individual and set off a chain reaction with most serious repercussions.

Under certain circumstances we may ask ourselves which of the two factors is more detrimental to the individual—his physical abnormality as disclosed by the highly sensitive electrocardiogram or his present awareness of it. The good diagnostician cannot and should not consider the heart muscle alone, but should at all times bear in mind the individual as a whole, a total personality. The latest experiments in physiology and biochemistry have shown that the sympathetic and para-sympathetic systems reach most organs of the body. Since these systems are affected by psychologic processes, the health and well-being of the entire organism must necessarily depend upon the emotional balance of the individual.

When I address a learned audience, I am affected by a peculiar dryness of the mouth or xerostomia. Under certain emotional stresses some people suffer from hypersalivation. The latter is due to an increased flow of blood through the salivary glands and their excessive stimulation. Dry mouth, on the other hand, is brought about by a reduced flow of blood through the salivary glands and by a diminution of their physiologic activity. When people are engaged in a heated argument or are in a state of rage, they often perceive dryness of the oral mucosa with a bitter taste in the mouth. If these states of fear, anxiety and rage were to last for a long time, they would give rise to pathologic changes in the salivary system.

Recent physiologic experimentation has established that estrin in the female, testosterone in the male, and the gonadotrophic hormones in both males and females have tremendous importance in maintaining physical and mental well-being in a state of balance. A functional impairment in the adrenal glands and pituitary body will have a profound influence in the direction of disease; degenerative, inflammatory and *increased sensitivity to the slightest irritation.* These facts alone may serve in part to shed light upon the oral burning syndrome as being engendered by a combination of endocrine disturbances and emotional stress.

Another important factor that has a definite bearing upon this synodrome is nutrition. A diet should be balanced. A lack of balance frequently leads to ill health and at times may constitute the difference between decrepitude and vitality. It is reasonable to assume, on the basis of extensive experience with patients that are afflicted with the mouth-burning syndrome, that it is not due to

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† Presented at the American Psychosomatic Forum, New York City, January, 1950.

one particular factor. In most instances, it is caused by many complex factors at work simultaneously; disorganization of the endocrine system, improper nutrition and emotional disturbances. Patients afflicted by the severe mouth-burning syndrome are mostly women in the postmenopausal stage, between the ages of 40 and 55. They usually suffer from psychologic symptoms in conjunction with the menopause. These may be:

1. coincidental with an incipient psychopathology,
2. an aggravation of a preexisting psychologic condition
3. a result of a disturbed nutrition
4. of menopausal endocrine origin, or
5. psychoneurosis associated with menopause.

The differential diagnosis is often extremely difficult to establish. The first three factors cannot be disregarded, but should be viewed as etiologic factors within the realm of possibility. They should be carefully evaluated in individual cases where their presence has been firmly established. The last two factors, viewed from the standpoint of practical clinical experience with a great number of this type of patient, should be considered as indisputable etiologic probabilities. Some mild cases of the mouth-burning syndrome have shown notable improvement under the care of the endocrinologist. The improvement under endocrine therapy evidences itself not only in the lessening of the burning sensation of the oral mucosa, but also in a favorable effect on the patient's emotional disturbance, a usual concomitant of the mouth burning symptom.

The last factor, phychoneurosis associated with menopause is of cardinal importance in the diagnosis of this condition. Even normal menopausal stages in a woman's life are associated with certain emotional disturbances. Abnormal cases of menopause, are almost always associated with psychoneurosis. They are so frequently concurrent that they have come to be regarded as a clinical syndrome. Some of these patients complain not only of the mouth-burning sensation, but very often also express concern about palpitation of the heart. They have a fear of becoming cardiac invalids. Medical examination, in most instances, does not disclose any heart abnormality to justify such fears. Some of these patients also complain pathetically of loneliness. Their husbands allegedly no longer show them any affection; their children, they feel, have turned selfish and cruel to a point of complete indifference to their suffering. A careful check-up with the family and relatives reveals no valid reason for such suspicion. Cancerophobia of the oral cavity is a prominent symptom of this psychoneurotic condition.

## DISCUSSION

1. The vast majority of patients afflicted by this syndrome are women in or past the stage of menopause. A relationship appears to exist between the transitional period in a woman's life and the local manifestation of a general condition called burning mouth.

2. These cases of burning mouth and concomitant menopause associated with irritability, nervous depression, and, at times, even melancholia, tend to show that the so-called pathologic cases of menopause furnish a fertile soil for local manifestation of disease.

3. Most of these patient are denture wearers and, in many instances these dentures are ill fitting. It seems reasonable to conclude, therefore, that the circulatory disturbances caused by traumatic occlusion of artificial dentures may serve as the inciting cause of the symptom of burning mouth. Once this symptom appears it is difficult to arrest even by reconstruction of the dental work. This is so because the widespread symptoms are of an emotional nature. Cancerophobia, palpitation of the heart and a manifestation of loss of interest in life are other examples of this type. Cause and effect in this syndrome are synergistic and interactive. This explains why these cases become aggravated quickly and their victims often become gravely involved emotionally to the point of demoralization.

4. In many instances, these patients exhibit a diminution of the flow of saliva. One may infer a relationship be-

tween the pathologic cases of menopause and diminished activity of the salivary glands. In turn, the artificial dentures in function, exerting constant friction upon an insufficiently lubricated mucosa, are apt to cause symptoms of burning of the mucous membrane.

5. Diabetes should be ruled out as an important pathogenic factor in the mouth burning symptom, because many diabetic patients on record wear artificial dentures without developing any of the symptoms under consideration.

6. In many instances, the patients are found to be lacking in a properly balanced diet. This indicates that there may be some relationship between lack of certain essentials in the diet and burning mouth.

7. The onset of the symptoms of burning in some cases soon after extensive general or oral surgery suggests another possible etiologic factor in this disease. Particularly does this hold true with regard to surgical operations performed on the female sexual organs or extensive surgical operations in the oral cavity. It is observed, not infrequently, that after patients have undergone such operations they become afflicted with the cancerophobia complex and soon afterwards with the mouth-burning syndrome.

Whether the mental shock of the operation on the nervous patient or the actual mechanical injury to certain nerves and blood vessels is responsible for this condition in the oral cavity, numbness may appear in certain areas, and this numbness may soon change into burning when the dentures are inserted.

8. Changing the materials of which the dentures are constructed results in no lasting improvement. The materials used in denture prosthesis apparently have but little to do with burning mouth. Therefore, allergy to denture base materials as an etiologic factor or even contributing factor in the mouth burning symptom has been vastly overrated. The thing of major importance to be borne in mind is the fact that some women in the menopause stage develop *an extreme hypersensitivity* of the oral mucosa to contact with or pressure by artificial restorations. The same pressure that will not cause the slightest discomfort to a healthy woman will be charged with causing excruciating pain by another woman who is under emotional stress during the menopause stage. When we discover the clue to this hypersensitivity and its working mechanism it will enable us in a great measure to control the mouth burning symptoms.

9. Cancerophobia is probably a result rather than a cause of the disease. Indeed, a nervous patient, after the age of fifty, suffering from constant burning of the mouth, would be likely to consider cancer as the cause. The fear of cancer tends to make the patient more and more melancholic and may indirectly aggravate the preexisting local condition. Cancer is a favorite subject of discussion among these patients. They bring this subject up whenever they call at the dentist's office. The emoional stress and strain under which they labor are apparent even to the casual observer. Their emotional difficulties become particularly and peculiarly obvious through careful history taking. It has been observed in many instances that prior to the onset of the symptoms of burning mouth, severe shocks of the central nervous system of the patient have usually been dealt by extraordinarily depressing events in their emotional lives (death of beloved ones in the family, desertion of the husband, reports of soldier-kin missing in action, etc.).

## TREATMENT

Treatment should be directed at all the etiologic factors.

1. All the sources of local irritation and undue pressure should be thoroughly eliminated.

2. Wherever indicated, hormones should be administered.

3. A balanced diet, rich in vitamins and essentials, should be instituted.

4. Psychotherapy.

The last, when properly directed, in very mild cases by the dentist, and in severe cases by the psychiatrist, is conducive to best results. In order that psychotherapy (in even the mildest cases of burning mouth) be successful, it is im-

portant that the dentist be fully acquainted with the past history of the patient's life and that he thoroughly understand the environmental conditions in which the patient is living. No dentist should undertake or continue the treatment of a case unless he is sure of the utmost confidence and cooperation of the patient. Because reassurance is an important factor in the treatment of this disorder, absolute confidence of the patient is imperative.

Of course, this brings us to the very complicated subject of doctor-patient relationship, which is of profound significance in the treatment of any disease, and on which dental literature is very meager. Much more attention has been devoted to this subject in medical literature. But even there the recognition is inadequate and not commensurate with the importance of the subject. As Binger states: "In spite of its significance not much of great moment has been written about it and some of its aspects still linger in the realm of unexplained mystery."

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## Montreal Section Receives its Charter

The first fall meeting of the Montreal section of the American Academy of Dental Medicine was held at the Windsor Hotel in Montreal on September 29, 1950.

The committee on arrangements did an excellent job of preparation for this splendid gathering. Dinner was served in a private dining room and the men fraternalized. After the meal the following men were installed in office by Past President George Bruns; President, W. J. Johnston; President-Elect, H. H. Pearson; Secretary-Treasury, A. Laferriere. Louis R. Burman, National President, then officially presented a charter to Dr. Johnston for the Montreal Section.

Continuing the meeting, Dr. Burman spoke on "Oral Diagnosis" supplemented by numerous slides. The talk was well received. Drs. Eidinger and G. Plamandon then thanked the speaker for his presence on this occasion.

Among the guests present were; Geo. F. Clarke of Boston; Sydney MacSween, President, Montreal Dental Club; I. Druckman, President, Mount Royal Dental Society; Guy Langelier, President, Societé Dentaire de Montréal; and Louis Rosen, President, Montreal Endodontia Society.

The attendance at the meeting was excellent and a spirit of good fellowship and learning prevailed. It was an auspicious occasion that will long be remembered by the members of the Montreal Section.

*Louis R. Burman, National President, presenting charter to Section President W. Johnston. Seated at head table (left to right), Drs. Clarke, Pearson, Bruns, Laferriere.*

# THE MODERN CONCEPT OF DENTAL CARE FOR CHILDREN

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## INTRODUCTION

An ancient philosopher once said, "Little can be accomplished for grown-up people, the intelligent man begins with the child." This statement is just as true today as it was in ancient times. In fact, it is more pertinent today than ever before. Pediatric care is better and more comprehensive. Formal education is starting earlier. We now have child development centers to diagnose and treat primary behavior disorders in children three and four years of age, in an attempt to prevent future disturbances. Last, but definitely not least, we have the modern concept of dental care for children.

The place that this concept occupies in the total range of dental health and dental care is not always appreciated by the public. Much has been written about dental care for the child in recent years and pedodontia has come to be recognized as a specialty because of the special problems presented in children's mouths. It may seem to follow that dental care for the child is something separate and distinct from dental care for the adult. This is, of course, not the case. If dentistry proposes to do a complete and preventive job in the community, the dentist must himself have a lively awareness that such care starts with the child and must educate his patients to recognize that fact.

Before discussing the newer concept, let us review the progress which has occurred in dentistry over the past half century. Dental science, dental literature, dental education, and dental public health have all advanced rapidly and consistently. Dental science has come into its own even though governmental aid and participation in dental research have only taken place since World War II. The National Bureau of Standards, however, started testing dental materials in 1919. Now the U. S. Public Health Service and the National Research Council have very active dental sections. The year 1900 saw three dental periodicals being published. Now we have 269 journals published regularly. The increase in number of dental books published during that period also compared favorably with that of the periodical publication and now we have the Dental Index and dental libraries which list and house our dental literature.

Dental education has changed considerably since 1900. The requirements for admission to the study of dentistry have increased steadily. In fact, a series of dental aptitude tests have just been adopted this past year in order to assist in the selection of students. Dental Public Health is one of the newest branches of public health. While it is difficult to definitely establish the year the first local unit was formed, the first state health departmental dental program appears to be that of North Carolina which was begun in 1918. The dental public health program is directed mainly toward children and prevention of dental disorders.

In essence, this is the modern concept of dental care for children. Today we are mainly concerned with the prevention of disease and dental ills. Years ago a child was only brought to the dentist when he had a toothache, and then either a sedative dressing was put in the tooth or it was extracted. Little attention was paid to preventing toothaches or to the loos of teeth. Today, we can and do prevent toothaches and the premature loss of deciduous teeth, but this cannot be done by the dentist alone. It requires the co-operation of the parent and the child. The parent is instructed to bring the child to the dentist as soon as he has all his deciduous teeth. This is usually between the ages of two and three. Each year more and more parents are following this advice because, through the profession and dental public education, they realize the reasons why a child needs a healthy mouth and teeth.

* Chief of Pedodontia Division, Midtown Hospital.

## RATIONALE

A child, like an adult, needs his teeth for chewing. However, in an adult proper chewing only aids digestion and assimilation but in the child it also will aid general body growth.

Also, proper jaw development is influenced and aided by a full set of healthy teeth in the child. If one of the deciduous teeth is lost too soon, or even a large part of a deciduous tooth is lost, an unnatural space is created and the secondary or primary tooth adjacent to the space will tend to tilt and grow into that space and thus possibly decrease the actual jaw development in that area of the mouth. This condition is one of the main causes of malocclusion.

Today with modern preventive dentistry for children we can often prevent malocclusion even when a deciduous tooth is or will be lost prematurely due to ectopic eruption. We can insert a space maintainer. This does exactly what its name implies, maintains the space created by the unfortunate loss of the deciduous tooth and thus enables the permanent tooth to erupt normally.

If a large part of a deciduous tooth is lost it can be restored with a gold crown and thus give it proper form and function. An article recently appeared extolling the advantages of a non-precious metal shell crown in restoring broken-down deciduous teeth. We definitely cannot see any advantage in such a crown over the cast gold crown. It cannot be much less expensive, since the cost of the gold in the gold crown is usually very insignificant. The chair time involved in making the gold crown is much less; there are no bands to fit, festoon, measure, or polish. All that is needed is to make a compound impression in a tray of the prepared tooth and pour an investment model directly into the impression. Then separate, wax up on the model, invest and cast. The total time including the laboratory time, after one becomes adept, should average one and one-half hours from the start of the preparation to cementation of the crown.

Another reason why we do not recommend the non-precious metal crowns is their extreme malleability. The shell crown, if it has a high cusp, can be bent with an instrument. The gold crown can have the same Brinell hardness as the enamel of the tooth, and thus wear at the same rate as the other teeth.

A quite evident reason why a child needs healthy teeth is to avoid the possibility of having a toothache. As we said before, one of our main goals in dentistry for children is the prevention of a toothache, not relief from the pain of one. If a toothache should occur, it should always be regarded as a late danger signal and the tooth examined and treated immediately. Odontalgia in a child as well as in an adult usually is the result of decay. If it is allowed to continue it may reach the pulp and cause exposure. However, with the modern means and research at our disposal, even this late stage of destruction of the tooth can sometimes be corrected and the tooth saved. The carious tooth substance may be removed as well as the crown part of the pulp which is affected by decay. The tooth is then filled and checked at intervals with roentgenograms and clinical examination. This technique is called pulpotomy. It is one of the last-ditch stands at our disposal against the onslaught and destruction caused by caries. Zander advocates the use of calcium hydroxide in this technic in order to promote healing. He has also shown that silver nitrate is ineffective in controlling caries. If the pulpotomy fails, the tooth must be extracted and the appliance mentioned above may be inserted. With adequate anesthesia, this entire operation can be done in one visit and without any pain to the child. Even though a healthy tooth is nature's space maintainer, an infected one can be a menace to health. A good rule to follow is that if the tooth cannot be treated and filled properly it should be exracted.

The fact that many infections of the vital organs of the body have been traced to the mouth or teeth cannot be stressed too strongly. Therefore, in order to eliminate the chance of lowered resistance, it is imperative that we keep the mouth in a healthy, clean state. Healthy teeth in a child also aid in proper speech and give a pleasant, cheerful appearance. We have

seen many shy retiring children transformed into happy, aggressive youngsters soon after their carious anterior teeth were restored.

## PRESENT CONCEPT

Now that we have reviewed the reasons why our children need healthy teeth, let us delve more deeply into the modern aspects of dental care for children. Just as the pregnant woman visits the physician because she is concerned about the future general health and well-being of her unborn child, so should she visit her dentist in the first few months of her pregnancy in order to learn more about its future dental health and well being as well as that of her own. Lay people do not realize that the child's first teeth, start forming early in pregnancy and that the dentist is in a position to advise and help the mother with regard to diet. This will give the child's teeth the essential nutritional elements they require. This is the very first phase of care for a child's teeth and this care and supervision should be continued at least until the child is about fifteen years old. Adequate diet will be beneficial since the permanent teeth calcify until approximately that age. Nevertheless, even with this care, it is possible that a child's teeth may be defective in structure and thus become susceptible to caries as soon as they erupt. It is important, therefore, that we examine the teeth carefully with a sharp explorer in a dry field as soon as full dentition is present. If there is any indication of caries susceptibility, the susceptible part can be removed and the remaining part polished so that the toothbrush bristles can reach it. Thus the initiation of decay can be prevented. This procedure, prophylactic odontotomy, has proven very effective especially with deep fissure on the occlusal surfaces of children's molars.

Another modern technic in the care of incipient decay in children's teeth is the cast gold inlay. We use the term "modern technic" even though it was originated more than twenty years ago. Today we use a modification of the procedure which aids greatly in the retention of the inlay. For many years the amalgam restoration was the best dentistry had to offer in the way of a filling material. The cast gold inlay is now preferred in many cases. It has been used with great success in the permanent dentition and there is a definite place for it in the field of dentistry for children, particularly young children.

The following are some of the problems involved in handling young children in the dental office. They require short visits because they are usually restless and tire easily. The flow of saliva is much greater in children than in adults, and this tends to obstruct the field of vision and makes it much more difficult to keep the mouth dry. If an amalgam filling is inserted under moisture it will expand and crack the fragile walls of the tooth already weakened by decay. Some children are frightened by the sight of the bur and the noise it creates. The bur is the main instrument used in preparing for the amalgam, while the knife-edge stone is the main instrument needed in preparing the tooth for the cast gold inlay. The stone, by virtue of its shape, cuts very quickly with little resultant heat and noise and thus very little discomfort.

The above are some of the problems involved in handling the child himself. The following are conditions associated with treating the child's teeth:

1. the size, shape and position of the large pulp.
2. the morphology of the deciduous tooth and its relation to matrix adaptation. (The complete encirclemen of the tooth with the matrix is the best for the amalgam restoraion.)
3. the difficulty involved in securing sufficient undercuts and bulk at the isthmus of the Class II cavity in order to make a good amalgam restoration, and
4. the contact point located at the gingival third which also presents a problem.

The cast gold inlay overcomes many of these problems. It is indicated in young children with incipient decay, and tight contact between their teeth which must be maintained for many years. If there are a few carious teeth in the same quadrant,

they may all be treated at the same time with a technic similar to the one mentioned previously in the discussion of the cast gold crown.

Another weapon in the fight against decay in children's teeth is the fluoride treatment. It is a safe, painless treatmen which tends to make the teeth harder and more resistant to the acids which cause decay. However, it cannot be stressed too strongly that a series of flouride treatments are not a panacea or a cure-all. Research work is also being done with penicillin and dentifrices and the next few years may see these adjuncts added to the list of methods and materials we have available to us in combating caries. It is also agreed that the reduction of readily fermentable sugars is highly desirable and effective in keeping decay to a minimum.

The best course of action to promote good teeth for children is good care, and good care implies early, frequent visits to the dentist for complete, thorough examination and treatment. A thorough examination includes a complete case history, dietary study, study models, and a full series of roentgenograms, including bite wings. They will show evidence of the following conditions, if present; any abnormalities, extra teeth, anklosed teeth, missing teeth, cavities on the proximal and biting surfaces of the teeth,, infectious tumors, condition of the bone support, resorption of the roots of the deciduous teeth, and finally buds of the permanent teeth.

Gingival and alveolar destruction, which might be called juvenile periodontoclasia, although it is not as common as decay, does exist. The best method of combating this is to prevent its inception. Proper toohbrushing which maintains good oral hygiene is the best preventive. A child is never too young to learn to handle a toothbrush. As soon as he handles other objects he should be allowed to handle a brush, and if the parents set a good example for him as to its proper use he will learn to use it himself. If it is done right after eating it will also reduce the number of bacteria in the oral cavity.

## CONCLUSION

In conclusion, and in order to summarize the present concept of dental care for children, we have listed ten factors which are the basis for this theory of complete care.

1. Pre-natal visits for dietry advice.
2. Complete, thorough examination and treatment as soon as the child has all his deciduous teeth.
3. Brushing teeth properly after ingestion of food.
4. Reduction of consumption of fermentable sugars.
5. Prophylactic odontotomy.
6. Fluorine treatments.
7. Gold and silver and other plastic restorations where indicated. Copper amalgam has no place in dentistry for children.
8. Pulpotomy or other pulp treatment.
9. Space maintainers. They are not necessary in the incisal region of the child's dentition.
10. Efficient recall system in order to maintain the high level of dental health which we have established for our young patients.

If these steps are taken and followed faithfully, the child of today has an excellent chance of developing a healthy adult dentition.

424 Madison Avenue.

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# PRESIDENT'S MESSAGE

This is the fifth year in the life of the American Academy of Dental Medicine. We have done a splendid work in the foundation and development of our organization to promote better understanding between the fields of dentistry and medicine.

Our society has expanded from our original thirteen to over five hundred valued and respected members of the dental, medical and associated professions all over the world.

It is interesting to note that we have successfully carried out the plans that were made five years ago.

1. The Journal of Dental Medicine has taken its place as a Grade A Publication, recognized by the American College of Dentists and all professional groups.
2. We now have active sections in Massachusetts, Connecticut, Iowa, New Jersey, New York, Montreal, Argentina and there are others being formed.
3. Decentralization of Officers and Committee Members has been accomplished to a great extent.
4. An award has been established and accepted by 36 dental schools and 59 medical schools for proficiency in dental medicine.
5. The organization is in good financial standing.
6. Our annual and semi-annual meetings have expanded and have proven of great scientific value.

These are some of the accomplishments of which we are justly proud. It is a great compliment to all of you and especially to the men who have guided you through these past years. They should be very pleased and happy. No organization can stand still. We must carry on the good work that has been started and go on to greater efforts.

Here are a few of the plans we have for the next year—

1. Visitation by officers to as many local sections as feasible.

LOUIS R. BURMAN, *President*
American Academy of Dental Medicine

2. Compilation of a directory of members to be printed together with the constitution for distribution to the membership.
3. Appointment of a planning committee to guide our activities for the future.
4. Expansion of the Journal.
5. Expansion of the membership and of local sections.
6. Continuation of the Dental Medicine Proficiency award.
7. Expansion of our endowment fund.

You have all been wonderful in the cooperation you have given our officers in the past, and we are certain that you can be depended upon to continue your efforts in the future. All of the accomplishments are your successes and you should be elated. I know that you will be ready to do your bit when called upon for help. With your assistance we can go on to greater achievements.

You have given me the privilege of

serving you, and I shall try to prove equal to the challenge and the opportunity.

My sincere thanks and best wishes for a successful and healthy year for all of you.

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## American Academy of Dental Medicine—New Members

Elected at Mid-Winter Meeting, December 3, 1950

ASSOCIATE

Adolph R. Berger, New York, N. Y.
Joseph Echikson, Newark, N. J.

ACTIVE

Henry Adelson, New York, N. Y.
Morton Amsterdam, Philadelphia, Pa.
Samuel L. Birnbaum, Ossining, N. Y.
Anna P. Boudin, New York, N. Y.
Dean Gale Collins, Odessa, Texas
Lloyd N. Cooper, Glenside, Pa.
Joseph M. Eisen, Jackson Heights, N. Y.
Matthew Eisenman, Wilmington, Del.
Samuel I. Glaser, Athol, Mass.
Maurice B. Grayson, New Haven, Conn.
William F. Harrigan, New York, N. Y.
I. Michael Harris, Teaneck, N. J.
Raymond Lewis Hayes, Washington, D. C.
Herbert Holland, Easton, Pa.
Melvin L. Lehrman, New York, N. Y.
Harold A. Lentz, Passaic, N. J.
Samuel W. Leslie, Toronto, Ontario, Canada
Myron Matlaw, New York, N. Y.
Louis Milstein, Malverne, N. Y.
S. Richard Nepola, Norwalk, Conn.
Seymour Pollock, Philadelphia, Pa.
William Rakower, New York, N. Y.
Murray A. Reinsdorf, Great Neck, N. Y.
Jacob Rosenbluth, New York, N. Y.
Martin Alan Rothman, New Haven, Conn.
Leo J. Schaefer, Brooklyn, N. Y.
Stanley Seton, New York, N. Y.
Everett B. Simmons, East Orange, N. J.
Irwin G. Tomack, New York, N. Y.
Martin Yorn, Newark, N. J.

## New York Section Hears Dr. William Wolf

On the night of October 25 a meeting of the New York Section of American Academy of Dental Medicine was held at the Hotel Statler. President A. DeVanna opened the meeting. Dr. S. C. Miller introduced the speaker of the evening, Dr. William Wolf, whose subject was "Endocrinology as Related to Dental Medicine."

Plans for the next section meeting are being formulated, and members will be notified at a future date.

Submitted by
THEODORE LITE, D.D.S.
*Editor, N. Y. Section*

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## Atlantic City Plays Host to A.A.D.M. June Meeting

Plan to attend the Fifth Annual Meeting of the American Academy of Dental Medicine, Friday, Saturday and Sunday, June 22, 23, 24, 1951; Hotel Dennis, Atlantic City, N. J. Bring the family; provisions have been made to take care of them. For reservations, write to Dr. Lester Older, 2115 New York Ave., Union City, N. J.

**LECTURES • CLINICS • RELAXATION**

# BOOK REVIEWS

**The Clinical Pathology and Treatment of the Dental Pulp and Pulpless Teeth.** By Edgar D. Coolidge, B.S.,M.S.,D.D.S. Philadelphia, Pa. Lea & Febiger, Sept. 1950. 300 p., 355 ill. $6.00.

Dr. Coolidge in his book "Endodontia" has written an excellent volume for the student and practicing dentist. It testifies to the fact that tremendous progress has been made in the field of pulp pathology and root canal treatment. An ever-increasing number of practicing dentists are showing an interest in saving the natural dentition from mutilation by unnecessary extractions. This book adds stature to Endodontia, which is rapidly becoming one of the fields of specialization in dentistry.

Dr. Collidge's book is lucid and well organized. While specific procedures and techniques are outlined clearly; the basic principles are stressed. This emphasis on principles is, in the reviewer's opinion, an indication of the increasing maturity of Endodontia. When the principles are understood, the techniques involved become clearer and easier to master.

As an example of this approach on the "principle" level we find excellent chapters on:

Therepeutic Principles; Anatomy of Root Canals with Relation to Pulp Removal and Root-Canal Filling; Principles and Technique of Filling Root Canals; Healing and Repair After Pulp Removal and Root-Canal Filling; Focal Infection.

Finally there is a chapter on "Pulpless Teeth" which sums up the history and philosophy of Endodontia.

This book describes the principles which establish Endodontia as a rational treatment and outlines the procedures which have proven successful. As such, "Endodontia" is a worthwhile addition to the literature.

M.A.

**International Dental Journal, Vol. I, No. I.** British Publication Inc., 150 East 35th Street, N. Y. Sept. 1950. 156 p., £2.55 per annum.

It can be said that in one sense this Journal has been fifty years in the making. It represents the efforts of the International Dental Federation (F.D.I.) to publish an international dental journal on scientific and social dentistry. National dental associations of thirty-five nations are represented, and it is planned to publish the Journal in as many languages as necessary as soon as the demand warrants.

The present issue is in English with appended summaries in French, German, Italian and Spanish. The Journal will be published quarterly.

This is an international effort to disseminate, on a world wide scale, scientific and social dental progress. The International Dental Journal is intended for the general practitioner. This first issue includes articles on dental caries (proteolytic theories) by H. E. Frisbie; balanced occlusion by Thure Brandrop-Wognsen of Stockholm; periodontia by Arthur Merritt; anatomical aspects of local anesthesia by Harry Sicher; public dental service in Great Britain by B. J. Wood; chemotherapy by F. D. Astrander; and a review of impressive technics in full denture prosthesis by W. J. Thuckfield of Melbourne.

The Journal will also record the transactions of each International Dental Congress, the next meeting of which will be held in London in July, 1952.

There is an obvious need for such a publication, and it is heartening to see such a sound start after so many disheartening delays.

A.N.Y.

**Principles of Internal Medicine,** Edited by T. R. Harrison, Paul B. Beeson, William H. Resnik, George W. Thron and M. M. Wintrobe, published by The Blakiston Com pany, 1950. 1590 p., 245 ill. $12.00.

This new textbook of internal disorders follows the modern trend in medical education. It presents the important scientific principles necessary for a rational understanding of development and management of disease. It integrates the pre-clinical sciences with clinical medicine and approaches disease from the standpoint of the disordered function as well as of structure. There is no longer the classic approach with emphasis on specific diseases; but, a clear interpretation of the underlying mechanism of the cardinal manfestations. Part I includes the major symptoms and stages of disease and the manner of their development. Part II includes psychologic considerations pertinent to bedside medicine. Part III includes reactions to stress and strain of disease. Part IV includes metabolic, endocrinologic and nutritional disorders. Other parts, of course, include diseases of the various organs and systems. The remarkable feature of the book is the approach to the patient by clinical methods. The symptomatic features are evaluated for cardinal manifestations of disease, the physiologic basis of each appropriately evaluated, the individual tendency evaluated and the final diagnosis attained by physical examination and confirmed by laboratory procedures. The book is an excel-

lent clinical summary of everyday practice in medicine. It is well written, clearly presented and readily amenable for quick reference.

I. NEWTON KUGELMASS

**Clinical Nutrition,** edited by Norman Jolliffe, M.D., F. F. Tisdall, M.D. and Paul R. Cannon, M.D., published by Paul B. Hoeber, Inc., 1950. 900 p., 127 ill. Price $12.00.

Frank deficiencies have long been recognized but they occur infrequently, whereas experience with animals in the laboratory and on the farm leads to the presumption that for every case of scurvy, beriberi, or pellagra there must be many cases of less severe degree of human malnutrition which escape detection. The diagnostic difficulty depends in part on the fact that early evidence of deficiencies of several nutrients is related to abnormalities of function, and these functional disturbances can be mimicked by many conditions which are primarily psychogenic in their origin. It also depends in part on the fact that the anatomic lesions related by students of nutrition to the less severe degrees of malnutrition, lesions such as folliculosis of the skin, thickening of the conjunctiva and atrophy of the papillae of the tongue are not specific and hence not pathognostic in and by themselves.

Lack of interest displayed by many physicians in this subject has led too frequently to prescribing vitamins as panaceas for illnesses and symptoms of many kinds, without regard to the great advance in our knowledge of the specific roles of vitamins and of human requirements for these and other nutrients. In the spotlight recently are protein hydrolysates, which have been employed by some physicians with almost equal lack of rationality.

This handbook will serve the very useful purpose of disseminating current knowledge to physicians in a helpful form, thereby contributing to lessening the difficulties just mentioned. A notable and most instructive feature of the book is the inclusion of many illustrations, in natural color, of manifestations of nutritional deficiencies in man.

I. NEWTON KUGELMASS

**Food for Little People.** Hazel Kepler and Elizabeth Hesser, New York. Funk and Wagnalls, 1950. 275pp. $3.75.

During the first year of life the average child at least triples its birth weight. After this time the very rapid increases in weight cease and the rate of growth of the child reaches a somewhat constant level until the time of puberty. These changes in the rate of growth are associated with changes in appetite. The sudden alteration in feeding habits around the time of the first birthday, from those of a voracious eater to those of one who is somewhat more particular about his food; and whose gain is much slower than formerly is very confusing to many mothers. The confusion which occurs between what the child eats and what the mother would like him to eat in order to maintain his former weight gains is the cause of many of the feeding problems in the older child.

At this time the mother is to be assured that the slowing of the rate of growth is physiologic and hints should be given on methods of making food more desired by the growing child. Many of tthe "secrets" the young mother would like to know to help her reach this goal are contained in this book.

The two major factors in the nutrition of the growing child—the psychologic approach to feeding the child and the actual physical preparation of the balanced diet—are considered in detail.

In addition to this, the authors present ideas on the preparation of and samples of menus for meals for special occasions, i.e. parties, times of illness and convalescence, the psychologic pitfalls in the preparation and serving of these meals.

An especially valuable feature of the book is found at the end of each chapter in the form of a brief resume of the important points therein. These are outlined under two headings, "The Good Mother Does," and "But the Wise Mother Doesn't."

The reading is easy, rapid and enjoyable and well worth the time of the pediatrician and mother of the young child.

N. S.

**Proceedings of the First ACTH Conference,** Edited by John R. Mote, published by the Blakiston Company, Philadelphia, 1950. 624 p., 414 ill. $5.50.

This monograph embodies the proceedings of an informal conference. It gives the status of ACTH projects in progress. The data reveals that adrenal cortical function is involved in a large number of disease syndromes. A new avenue of therapy has thus been opened up for the elucidation of the mechanism and management of apparently unrelated disorders. This volume reveals preliminary observations of the effects of ACTH in various metabolic, neoplastic, nephritic, arthritic, hepatic and collagen diseases. Each paper is presented in terms of clinical and experimental observations with pertinent discussions of other members of the conference. The data is preliminary and in no sense a final evaluation of effect of ACTH in any of these disorders.

I. NEWTON KUGELMASS

# MEDICAL VIEWS ON ORAL PROBLEMS

## PREGNANCY AND TOOTH DECAY*

Statistical data on a large number of pregnant and nonpregnant women of different age groups led Day and Shourie to conclude that caries susceptibility does not increase as a result of childbearing. From similar evidence Ziskin and Hotelling concluded that the factors operating during pregnancy actually prevent tooth decay. Experimental test of these conclusions is reported by Granados and his associates of the Polytechnic Institute, Copenhagen, Denmark. The Danish biologists maintained newly weaned female hamsters for three and a half months on a suboptimal diet, consisting of finely ground yellow corn, sucrose, cornstarch, powdered whole milk, salt mixture and vitamins. At the end of fifty-six days 14 female hamsters were successfully mated, while 13 others were set aside as nonpregnant controls. At the end of three and a half months all female hamsters were killed and the carious lesions scored. In the pregnant group the average number of carious molars was 8.0, while there was an average of 8.5 in the nonpregnant group. The average number of individual carious lesions was 11.5 and 10.8, respectively. From this evidence it was concluded that, within the limits of the statistical error, pregnancy did not influence caries activity in this experiment.

* J.A.M.A. Dec. 10, 1949.

## ENAMEL EROSIVE PROPERTIES OF FRUITS AND FRUIT JUICES*

Miller points out that a number of investigators have shown that acid beverages, natural or synthetic, when fed to rats cause destruction of the lingual enamel of the molar teeth. Miller compared the enamel erosive properties of fruits with those of the juices made from them. He fed tropical and semitropical fruits—grapefruit, guava, Java plum, mango and pineapple—and juices prepared from them to standard rats to determine their enamel erosive properties. Quantities of juice equivalent to the daily fruit supplement had three to ten times the enamel erosive properties of the fruits themselves. No adequate explanation for the different effect of fruit and fruit juice can be offered at the present time, but it appears not to be related to the titratable acidity of the two. Data given for five fruits of widely different species and preliminary experiments with two other fruits appear to justify the postulate that acid fruits generally have a slight enamel erosive effect, in contrast to the decided effect of the juices made from them.

* J.A.M.A. Sept. 16, 1950.

## CARCINOMA OF TONGUE*

*To the Editor:* Five years ago a 65 year old woman had a small ulceration of the lateral border of the mobile portion of the tongue which was electrocoagulated. She did not complain until five months ago, when her family learned she had been hiding an ulceration on the tongue. A doctor sent her to the roentgenologist, who gave her a twenty-five day course of roentgenotherapy. She had 2,500 r externally and 2,000 perorally (2 mm. of copper, 1 mm. of aluminum distance 50 cm., 220 kilowatts, 10 milliamperes). The irradiations were given daily, one day externally and the other perorally. Her condition did not improve, and the induration around the ulceration became larger; the tongue was partially fixed. The pain got worse, so that the patient could not take solid food. Several doctors in consultation decided that the lesion was not operable. Her present condition is good generally, but there is an oval ulceration on the lateral border of the free portion of the tongue, 5 by 2 by 1 cm. deep. There is induration on the floor of the mouth and half of the tongue but no bleeding. The ulceration is rather clean, and the cervical nodes are large. Is interstitial irradiation with radium justified in this case? Have you any other suggestion? The diagnosis is epidermoid carcinoma (spindle cell) grade III (Broders).

Haroldo G. Juacaba, M.D., Brazil.

ANSWER.—The prognosis appears hopeless. Interstital radium or radon therapy would add to the patient's discomfort, would not result in a cure and therefore is contraindicated. On the basis of what has been stated, it would appear that more external radiation is possible, with an air dose of about 4,000 to 5,000 r through a submental port with the equipment mentioned. Total elapsed time for the treatment should not exceed four weeks and preferably should be given in about three weeks. The metastic lymph nodes, if not included in this field, may be treated separately with up to 3,000 r air dose in a three week interval. Good oral hygiene and even treatment with penicillin or other antibiotics, either topically or parentally, often relieve some of the pain and discomfort due to secondary infection.

* J.A.M.A. Feb. 4, 1950.

## LUPUS ERYTHEMATOSUS*

*To the Editor:* Becker (*Proc. Soc. Exper. Biol. & Med.* 69:247 [Nov.] 1948) describes inhibition of the Shwartzman phe-

nomenon in animals by premedication with nitrogen mustard and benzol and by spray roentgen irradiation. This is interpreted as an inhibition or depletion by those substances of the hypersensitivity of the reticuloendothelial system. Nitrogen mustard is suggested as a therapeutic agent for several of the "collagen" diseases. I have a patient with disseminated lupus who is becoming progressively worse. What information do you have relative to this new approach approach to this disease?

Keith Aull, M.D., Burlingame, Calif.

ANSWER.—As far as is known, nitrogen mustard has not been used in the treatment of lupus erythematosus disseminatus. Becker's suggestion that this compound be employed in the treatment of this disease was based on the theoretical interpretation of his experiments with nitrogen mustard on the Shwartzman phenomenon. A much more promising lead in the treatment of lupus and other "collagen" diseases is the use of pituitary adrenal corticotrophis hormone (ACTH) and cortisone (a steroid) employed by Hench and associates of the Mayo Clinic in the treatment of rheumatoid arthritis and rheumatic fever.

* J.A.M.A. Feb. 4, 1950.

## PSYCHOSOMATIC TOOTH DECAY*

From clinical observations Mellars,[1] Miller[2] and others have suggested that numerous pathologic oral conditions may be due to psychosomatic factors. To test this theory Manhold[3] and his associates of the Department of Oral Pathology, Tufts College, Boston, made a comparison of the relationship between neurotic tendencies and dental caries in 49 students, faculty members and employees of his college. Each person was tested according to Bernreuter's[4] personality inventory technic and assigned scores varying from 0 to 100 on his neurotic scale. There were also recorded the DMF (decayed, missing, filled) dental scores. Among the 49 subjects, 28 were below the lowest level of neurotic tendencies, scoring 60 per cent or less on the Bernreuter scale. Of these, 24, or 85 per cent, had gained less than a 40 DMF score. Of the 21 subjects with neurotic tendencies (or Bernreuter percentages above 60) 16, or 76 per cent, had DMF scores above 40. High neurotic tendencies were thus correlated with high DMF scores and subneurotic tendencies with low DMF scores. A similar correlation was noted with Bernreuter's introversion-extroversion scores, 78 per cent of those with high scores showing DMF scores above 40 while 84 per cent of those with low scores showed DMF scores below 40. There appears to be a significant correlation between psychologic factors and dental caries, but the subject merits further investigation with different types and a larger number of subjects.

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* J.A.M.A. Feb. 11, 1950

## STAINING OF TEETH*

*To the Editor:* I have noticed the darkening of the teeth of a few of my patients who have been taking ferrous sulfate (2 teaspoons contains 0.33 Gm.) (feosol) elixir. Kindly advise whether this is due to the medicament. If this is so, how long is it safe to use the ferrous sulfate elixir, and what can be done for teeth so affected?

M.D., New York.

ANSWER.—The staining is due to the deposition of metallic iron on the tooth surface. This staining is not permanent if removed in a short time by cleansing by a dentist. It may become fixed if permitted to remain for a long while. The patient should be instructed to take the iron medicament through a glass tube or by coated pill. If an elixir is preferred, the patient should brush his teeth thoroughly after each dose.

* J.A.M.A. July 8, 1950.

## CANCER OF THE TONGUE*

Sharp and co-workers report their experience in the treatment of 84 patients with cancer of the tongue, observed between 1932 and 1944. Lingual cancer is more malignant than other oral neoplasms; no time should be lost before the start of treatment. They believe that early recognition and treatment of the precancerous lesions would prevent 30 to 40 per cent of lingual cancers. These include, in addition to leukoplakia, such lesions as papillomas, fissures of the tongue, burns and scars from continuous denture irritation. A good system of classification of lingual cancer is of value for prognosis and selection of treatment. The authors suggest the following classification: The first stage includes primary growths less than 1.5 cm. in diameter; the second stage those less than 3cm. in diameter; the third stage primary growths of any size but with unilateral involvement of cervical nodes, permitting surgical removal; the fourth stage primary growths with invasion of surrounding structures and inoperable cervical metastases. According to this grouping, the lesions in 29 per cent of their patients were in stages 1 and 2, and these represented 70 per cent of the total five-year apparent cures. Chance of cure is about four times as good for a lesion in

stages 1 or 2 as for one in stages 3 or 4. The five-year end results demonstrate that in the presence of involvement of the lymph nodes, the cure rate is only 17 per cent, compared with 62 per cent of those without involvement of lymph nodes. The decision as to surgical intervention or radiation is determined not only by the nature of the growth but by the experience of the therapist. For the small growth, 2 cm. in diameter, on the tip or border of the tongue, intraoral excision assures a brief convalescence, although deformity and impaired movement results. The removal of 2.0 cm. of normal tissue on all sides of the growth is absolutely essential. At least 75 per cent of primary healing without local recurrence can be expected in this early group of cases. Radium needles alone or in combination with roentgen therapy may produce the same results, and in the opinion of the authors they are safer. The large middle group of primary tumors that make up stages 2 and 3 and are still limited to the boundaries of the tongue constitute a radiation problem. Radium needles and roentgen rays are the agents used for the destruction of this group. Primary healing of the lingual lesion was obtained in 42 per cent. The authors describe the various technics of irradiation. The stage 4 lingual cancers, which have metastasized to the cervical nodes, require a block resection of part of the tongue, jaw and cervical nodes.

* J.A.M.A. Oct. 7, 1950.

## PTYALISM*

*To the Editor:* A white man aged 50 was given 300,000 units of procaine penicillin in oil and beeswax intramuscularly for a furuncle inside the nose three months ago. Two weeks after the injection, urticaria and increased salivation developed. He was treated with antihistaminic drugs, and after six weeks there were no more skin reactions. However, the pytalism has continued. There is no history of any previous allergic manifestations. He had a transurethral prostatectomy last year. At present he feels in excellent health except for the ptyalism, which is causing him anxiety and worry. There is no difficulty in swallowing the saliva. His blood pressure is 120 systolic and 80 diastolic, pulse rate 66, height 5 feet 6 inches (168 Cm.) and weight 160 pounds (72.6 Kg.). Physical examination reveals no abnormality or disease except a somewhat elongated uvula. Can increased salivation result from penicillin sensitivity? What treatment is advised?

M.D., Canada.

ANSWER.—Since ptyalism as a manifestation of penicillin hypersensitivity has not been reported previously, it would be well to explore other possibilities such as peptic ulcer of the lower part of esophagus, stomach or duodenum or pancreatic disease. Also, it would be well to determine some of the inciting factors concerned with ptyalism, such as the effect of any special food and any history of allergic difficulties other than those that followed penicillin therapy. F. Parkes Weber (Weber, F. P.: Paroxysmal Salivation and Ideological Explanations, in Endocrine Tumours, and Other Essays, London, Lewis, 1936, page 132) called attention to acute paroxysmal attacks of salivation induced by muscular exercise, especially exercise soon after meals; in some such cases the attack can be stopped by assuming the horizontal position. He suggested that an allergic factor is important in inducing paroxysmal salivation in some patients. Treatment may be unsatisfactory unless one can determine the inciting cause of the salivation.

* From J.A.M.A., Aug. 5, 1950.

## SOLID EDEMA OF FACE*

*To the Editor:* A 45 year old white radio repairman complains of a feeling of fulness in his face and between his eyes. When he smiles, his eyes are closed. His friends tell him his face is becoming fat. He has no unusual headaches and no visual disturbances. The onset was some six weeks previously, after a difficult extraction of a first molar on the right. After this he had an episode which was diagnosed as acute sinusitis and was given three injections of penicillin. This promptly caused an allergic reaction with swelling of the feet, hands and face. At present there is no evidence of drainage from the sinuses. Physical examination and blood studies reveal no abnormalities, except browny edema in each cheek and increased width between the eyes. There is no pitting edema. The urine is normal. His condition, he feels, has become progressively worse; however, obviously there is little change in a two week period. Please discuss possible causes.

M.D., Texas.

ANSWER.—The clinical picture described may correspond to what is called "solid edema" of the face. There appear to be some different pictures of this entity. In some cases it occurs with signs of recurrent inflammation (erysipelas-like) and with constitutional phenomena. In other instances these changes are absent and the chief signs are those of an increasing brawny swelling as described above and with a tendency toward chronicity. This condition is said to follow infections about the teeth, face and sinuses. The underlying histologic changes are lymphangitis, cellulitis and, in some instances, thrombophlebitis. Ormsby and Montgomery discuss rather fully this and similar type diseases in their textbook (Diseases of the Skin, Ed. 7, Philadelphia, Lea & Febiger, 1948).

* From J.A.M.A., July 27, 1950.

# QUERIES AND ANSWERS

Dear Sirs:

Suppose a lower third molar with a horizontal impaction is extracted, discuss the possibility of the deposition of bone in this area to support the second molar. With a similar impaction in the upper jaw where the third molar was in contact with the trifurcation of the second molar what would be the sequel after the extraction? What possibility for the regeneration of bone? What about the trifurcation becoming deeply involved and the tooth therefore hopeless?

L.W.S., New Rochelle, N. Y.

It has been expressed in certain textbooks that if more than one half of the root of the second molar is exposed in the removal of an impacted tooth, there is a possibility that the second molar might need removal also. However, this does not occur in clinical practice. There are many third molars both upper and lower which are removed with more than half of the root of the second molar becoming exposed and the second molar is still allowed to remain in place and is serviceable. However, any healing and regeneration of bone is a function of osteoblastic activity under ideal conditions, i.e. lack of movement and infection. I feel that ordinarily these ideal conditions exist and there is a certain amount of regeneration of bone. However, when there is much distal bone removed from the second molar area, we are introducing the possibility of movement which tends to discourage osteoblastic activity in favor of fibroblastic activity. Therefore, I would like to see surgery in cooperation with Crown and Bridge, or Orthodontia, make bands which could be placed around the second molar tooth and attached also to the first molar so that movement of the second molar is nullified. I think the same situation occurs in both the upper and lower jaws and to be on the most conservative side, and to permit ideal healing and bone regeneration, I would like to see it a more common practice among dentists to make the aforementioned bands before extraction of the third molar.

William F. Harrigan, M.D.,D.D.S.

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# ABSTRACTS

## Dental Caries*

Tooth decay can be reduced between 50 and 60 per cent by the relatively simple process of brushing and rinsing the teeth immediately after eating, Dr. Leonard S. Fosdick, Northwestern University chemist, reported in The Journal of the American Dental Association.

Dr. Fosdick's report was based on a two-year research study conducted by a group of dental investigators among 946 men and women students at Simpson College, University of Louisville and Drake, Emory and Northwestern Universities.

During the test period, an experimental group of 523 students brushed their teeth with a neutral tooth paste within 10 minutes after eating, or if that was impossible, rinsed their mouths thoroughly with water. The other 423 students served as a control group and merely continued their normal oral hygiene habits, most of them brushing their teeth upon arising and before retiring.

Roentgenographic examinations at the end of the first year revealed that the experimental group had developed an average of only .8 new cavities compared with an average of 2.2 new cavities for the control group, a reduction of 63 per cent. At the end of the second year, roentgenographic examinations revealed the experimental group had 60 per cent less new cavities than the control group.

The results, Dr. Fosdick said, provide additional support for the generally accepted theory that dental decay, mankind's most common disease, is initiated by an acid formed very rapidly in the mouth from fermentable carbohydrates such as sugar. This acid, he said, may be present on the tooth surface within three minutes after eating sugar, reaching a maximum intensity within about 20 minutes and persisting for from 30 to 90 minutes.

By brushing the teeth and rinsing the mouth immediately after eating, the fermentable carbohydrates are removed before sufficient acid is formed to initiate the decay process, he pointed out.

"On the basis of the . . . work, it is plain that the reduction in carious (decay) activity

* A.D.A. News Release.

by purely oral hygiene procedures is real and that the actual reduction is probably in the neighborhood of between 50 and 60 per cent," Dr. Fosdick wrote, adding:

"It should be recorded that in general all of the individuals in both the test and control groups had soft drinks and candy readily available during the day with the exception of one control group. This factor was reflected in the variations from group to group.

"The control (group) in the school where candy and soft drinks were not available had a caries increment far below the averages reported previously in similar work. In those institutions where a water fountain was close to the soft drink and candy dispenser, less carious surfaces were found in both control and test groups than in groups where water was absent."

Dr. Fosdick described as "striking" the fact that a large number of individuals developed very few cavities or none at all during the test period.

"Thus it seems" he continued, "that brushing the teeth immediately after eating will materially reduce the number of cavities, not in just the least susceptible, but also in those cases where a multitude of cavities would otherwise develop. Those individuals who are only mildly caries-active develop no caries and the very active ones develop only a few lesions (cavities)."

## Toothbrushing and Gingival Health*

Healthy gingivae can best be maintained by regular, thorough and careful toothbrushing, Dr. Maynard K. Hine, of Indianapolis, dean of the Indiana University School of Dentistry, reported recently in The Journal of the American Dental Association.

Advocating three to five minutes of brushing at a time, Dr. Hine described the firm healthy gingiva as pale coral pink with a well-stippled "orange peel" surface.

He said effectiveness of dental treatment for gingival disorders can only be short-lived unless the patient carries out good toothbrushing procedures at home carefully and persistently.

The Indiana dental educator recommended as an effective kind of toothbrush one with an inch-long head, containing medium one-half inch long bristle brushes that are bound in tufts about one-eighth of an inch apart and mounted in two rows of six tufts each.

Among toothbrushing technics, Dr. Hine said that "it is generally agreed that the brushing should be done in a manner which will not allow the ends of the bristles to irritate the gingival tissue."

He said the sides of the bristles should be pressed against the gums and as much pressure should be used as can be tolerated.

He asserted, however, that there is no one universally preferred technic for toothbrushing and that the individual should follow the advice of his dentist in a procedure suited to his individual needs.

As for dentifrices, he quoted a formula: "Equal parts of water and elbow grease."

"Most people will use dentifrices because of their pleasant taste," he said. "Some dentifrices polish the teeth well, and therefore have a cosmetic value to the patient."

In another article, brown and green stains on the teeth of children were reported to have no value as an indication of tooth decay or immunity to decay.

Dr. S. Wah Leung, of Rochester, N. Y., Eastman fellow in dentistry at the University of Rochester School of Medicine and Dentistry, based his findings on a study of 355 persons between the ages of four and 20 at five midwest orphanages.

Dr. Leung pointed out that the negative relations between stains and tooth decay contrasted with opinions advanced by other dental scientists.

"There is a prevalent belief that the brown stain is associated with a relative immunity to dental caries (decay)," he said. "Our own findings indicate that there is no difference in the caries experience of those persons who have the brown stain and those without it."

Similarly, he said, green stains have been associated with corrosion of tooth enamel.

"Our findings," Dr. Leung said, "showed no association between green stain and caries."

* A.D.A. Press Release.

# ANNOUNCEMENTS

## 19th Annual Postgraduate Clinic of the District of Columbia Dental Society

The District of Columbia Dental Society's 19th Annual Postgraduate Clinic will be held March 11-14, 1951, at the Shoreham Hotel, Washington, D. C.

Each year, this meeting is growing in scientific, social and commercial value, and this forthcoming meeting will prove no exception.

There will be nationally known clinicians and essayists, speakers of wide renown, exhibitors showing the latest and newest products, registered clinics, table clinics, visual education, important scientific sessions, and fine social entertainment.

The registered clinicians, who will present one-day postgraduate courses and their subjects, are: Dr. Stanley Tylman, Crown and Bridge; Dr. J. Lewis Blass, Practice Management; Dr. Herbert Coy, Plastic Fillings; Dr. Edward L. Ball, Periodontia; Dr. George Matthews, Exodontia; and the Prosthetic Staff of the U. S. Naval Dental School, Bethesda, Maryland, Prosthetics.

Dr. Francis J. Fabrizio, General Chairman of the Postgraduate Clinic, has stated "every effort is being made to give members of the dental profession a well balanced educational and scientific program."

## University of Pennsylvania Postgraduate Courses

### P.G. 26 (50-51) Oral Diagnosis and Roentgenology, 8-19 January, 1951

LeRoy M. Ennis, D.D.S., Lester W. Burket, D.D.S.,M.D. and Associates

This course has been arranged for the general practitioner who wishes to increase his knowledge and ability in oral diagnosis and roentgenology.

The importance of comprehensive oral diagnosis as a prerequisite to the ovar-all treatment planning of the patient is emphasized. The diagnosis of occlusal abnormalities, lesions of the teeth and their investing tissues, the tongue and oral mucosa are thoroughly discussed. The oral manifestations of nutritional deficiencies, diseases of the blood and other systemic disturbances are also presented.

The basic principles of roentgenology and their application in the taking of all types of roentgenograms are presented by lectures and clinical demonstrations. The members of the class are afforded an opportunity to gain experience in taking all types of roentgenograms including those for jaw fractures and the temporomandibular joint. Stress is placed on the accurate interpretation of normal anatomic landmarks and pathologic lesions of the teeth, jaws and associated structures.

Tuition Fee $225.00 Enrollment limit—16

### P.G. 39 (50-51) A Postgraduate Course for Dentists and Dental Hygienists Interested in Public Health Dentistry and Dental Health Education, 22-25 January, 1951

Abram Cohen, D.D.S. and Associates

Many dental practitioners have been presented with the opportunity to disseminate the importance and value of dental health education at the community level, the school level and the private practice level. Some have failed to take advantage of such opportunities due to the lack of adequate material and a definite procedure for presentation. This course has been arranged to supply members of the dental profession and dental hygienists in both public health work and private practice with adequate teaching material and the adaptation for use of this material to promote greater reception by the laity of a reparative and preventive dentistry program.

Tuition Fee $75.00 Enrollment limit—50

For further information write to:
Lester W. Burket, D.D.S.,M.D.
*Director of Postgraduate Courses*
*University of Pennsylvania*
40th and Spruce Streets
Philadelphia 4, Penn.

## Ohio State University Announces Postgraduate Schedule

Children's Dentistry — L. S. Pettit — Jan. 29-Feb. 2
Oral Surgery — D. P. Snyder — Feb. 5-9
Oral Pathology and Diagnosis — H. B. G. Robinson — Feb. 12-16
Full Denture Prosthesis — Carl O. Boucher — Feb. 19-23
Periodontia — John R. Wilson — Feb. 26-March 2
Partial Denture Prosthesis — V. L. Steffel — Feb. 26-March 2
Endodontia — J. Henry Kaiser — March 5-9
Anatomy of Head and Neck — L. F. Edward — March 19-23

Each course is given for five consecutive days, Monday through Friday, and the fee for each course is $50 except for Oral Surgery which is $100. All of the courses have been approved by the Veterans Administration. The classes are limited to ten men each so that there is opportunity for discussion and personalized instruction.

Further information and application may be secured from the Postgraduate Division of the College of Dentistry, Ohio State University, Columbus 10, Ohio.

## Periodontia Postgraduate Courses at N.Y.U.

PERIODONTIA 123B (intermittent, evening-afternoon)

This 20-hour course consists of a study of the following: etiology; pathology; diagnosis; prognosis of periodontal disease; equilibration of occlusion; gingival massage, instrumentation, conservative and radical treatment; acute necrotizing ulcerative gingivitis (Vincent's Infection); drugs; diet; maintenance of mouth health; prevention, etc.

Ten, weekly, two-hour sessions, Thursdays, 7 to 9 p.m. (for first four sessions—lectures) and 4 to 6 p.m. (for last six sessions—clinical demonstration), March 1 to May 3, 1951. Tuition $130.00. Books $21.50. Instruments approximately $65.00. Rental fee $1.00.

PERIODONTIA 123C

Review course (one week). June 11 to June 16, 1951, Monday through Friday, 9 a.m. to 12 m. and 1 to 4 p.m., Saturday 9 a.m. to 12 m. Limited to previous periodontia postgraduate students. Tuition $130.00. No instruments required.

PERIODONTIA 124 (continuous, morning-afternoon)

This 90-hour course consists of a study of the following: etiology; pathology; diagnosis; prognosis of periodontal disease; equilibration of occlusion; gingival massage; instrumentation, conservative and radical treatment; acute necrotizing ulcerative gingivitis (Vincent's Infection); drugs; diet; maintenance of mouth health; prevention, etc.

Fifteen, six-hour sessions, daily, Monday through Friday, 9 a.m. to 4 p.m., June 4 to June 22, 1951. Tuition $300.00. Books $21.50. Instruments approximately $65.00. Rental fee $1.00.

*For further information apply to:*

Director, Postgraduate Division
NEW YORK UNIVERSITY, COLLEGE OF DENTISTRY
209 East 23rd Street
New York City, N. Y.

## Airbrasive Course at Ohio State

The College of Dentistry of The Ohio State University is presenting a five day course in Airbrasive Theory and Technic each week beginning January 8, 1951.

Each class will be limited to 10 dentists and will begin at 9 A. M., Monday and terminates at 4 P. M., Friday. The courses will include lectures, demonstration, and practice. The fee for each course will be $100 per dentist and the courses may be taken under the G. I. Bill of Rights.

Application forms may be secured from the Director of the Post-graduate Division, Box 17, College of Dentistry, Ohio State University, Columbus 10, Ohio.

## Clinical Clerkships for Veterans in Dental ROTC

A recent policy in the Army and Air Force authorizes, in lieu of the usual summer camp, clinical clerkships for veterans enrolled in the ROTC who have completed their third year of Dental training. These "Clerkship" courses are of six week duration and are held at the large named Army Hospitals throughout the United States. Letterman and Madigan Army Hospitals in the Sixth Army area conducted such training during last August and September.

The six week training period covered the functioning of a large Army hospital dental service. Students attended various professional staff conferences, observed the care and treatment of the many interesting clinical cases always available in such hospitals, and attended lectures given by both staff members and civilian consultants of these teaching hospitals.

Nineteen students from the University of California College of Dentistry took clerkship training last summer. Upon their return to college they generally agreed that the training was well organized, interesting, professionally profitable and well worth their time.

## New Jersey Section Meeting November 7, 1950

The meeting was called to order by President Older at 7:45 P.M. at the Hotel Douglas in Newark. Members present were: Drs. Becker, Copperthwaite, Englander, Gelhaar, Kelston, London, B. Lavine, Mintz, DeScherer, Rifici, Schambach, Older, Turkenkopf.

A progress report of the work of the Convention Committee was given by Co-Chairman, Dr. Becker, in which he outlined the general program in detail. He outlined carefully the duties of the several committees, urging them to get speedily and efficiently to work so that complete plans may be set forth at the semi-annual meeting of the Academy in New York in December.

Dr. Shambach was elected delegate, and Dr. Kelsten alternate, to the December meeting to be held at the Hotel Statler in New York.

A motion was made by Dr. London that definite meeting nights be determined. The motion was seconded, and the second Tuesday in October, January, and April were voted as the regular meeting dates.

A motion made by Dr. Englander that officers take office at the first yearly meeting in October was carried.

Dr. Mintz made a motion that the Bulletin of the N. J. Section of the A.A.D.M. be published four times annually; in February, May, September, and December. The motion was carried.

Dr. I. Michael Harris of Teaneck, N. J. was proposed for membership by Dr. Older.

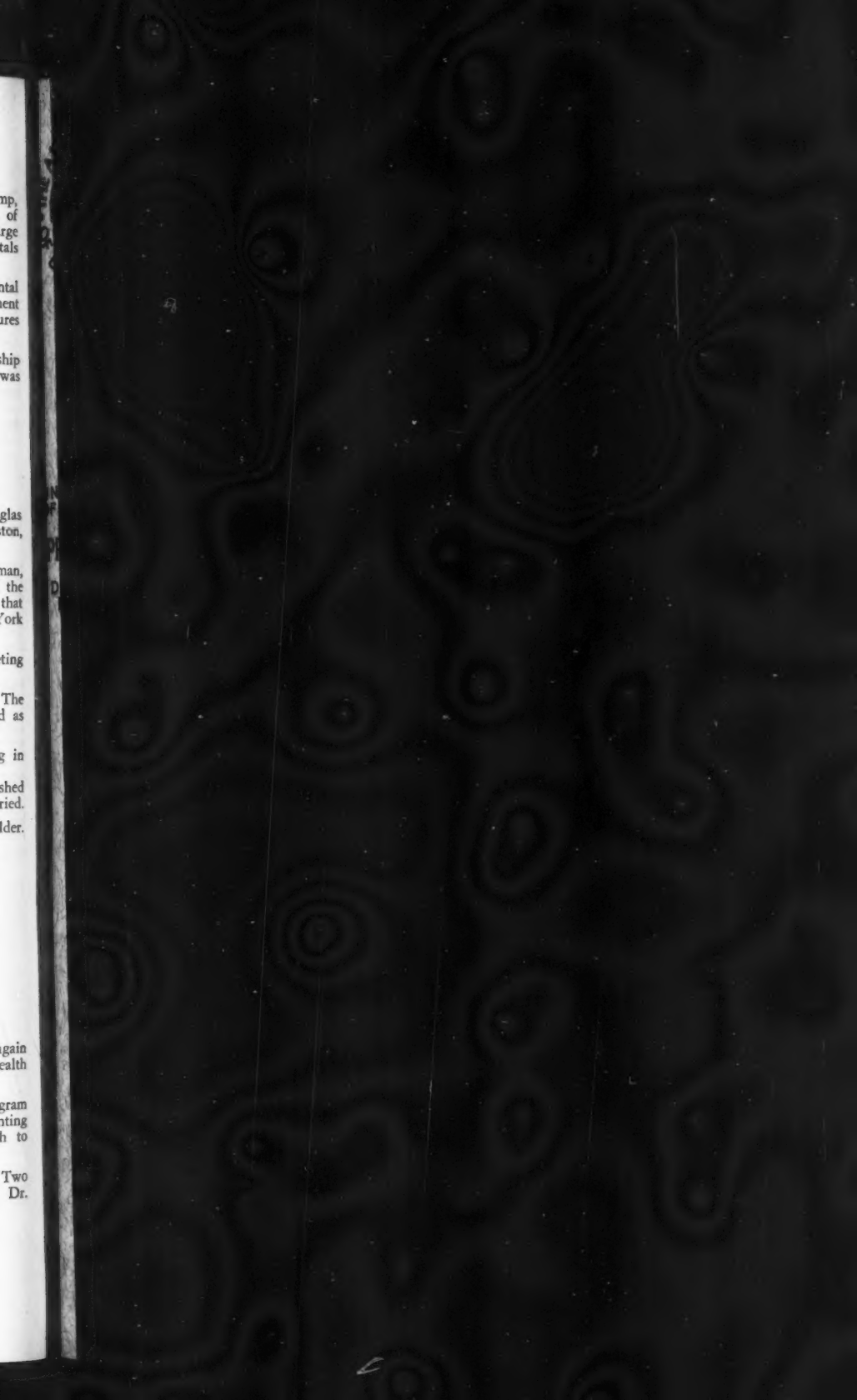
The meeting was adjourned at 11:30 P.M.

Respectfully submitted,

SAMUEL TURKENKOPF, *Secretary-Treasurer*

## Children's Dental Health Week
## New York City — 1951

The dentists of Greater New York, through the Oral Hygiene Committee, will again have a program of public dental health education in the form of Children's Dental Health Week. This will take place from February 5th through February 9th, 1951.

The program for 1951 will stress four aspects of dental care—the bitewing roentgenogram (representing dental examination and treatment), tooth brushing and nutrition (representing home care), and the application of fluoride (representing the contribution of research to dentistry).

More than 1000 Dentists, Hygienists, Assistants and Dealers are already taking part. Two hundred fifty more men and/women are still needed. For further information write to Dr. M. Joel Freedman, General Chairman, 300 West 23rd Street, New York City, N. Y.